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MAY 21 1949

# STEEL

The Magazine of Metalworking and Metalproducing

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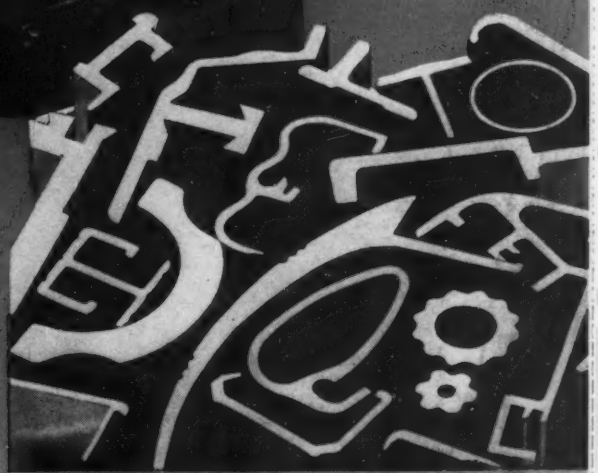
LOMBARD

4-COLUMN HYDRAULIC
EXTRUSION PRESSES

Lombard 1100-Ton Horizontal Extrusion Press.

Some of the many non-ferrous sections produced by Lombard extrusion presses.



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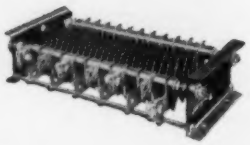
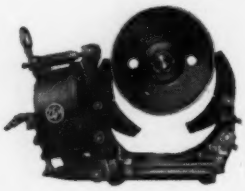


TAB - WELD Resistors — no burning where burning would cause high up-keep.



LONG-LIFE Brakes give high speed performance—with low up-keep.

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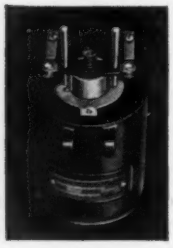
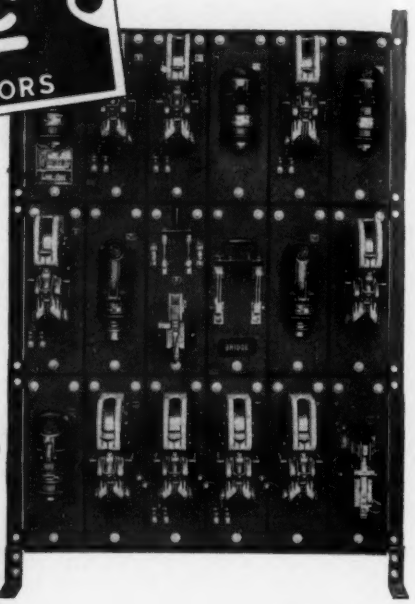


TIME-CURRENT Relay matches acceleration to the d-c load.

WITH LINE-ARC (TRADE MARK REG.) CONTACTORS

N.P. 168



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### *for specifying*

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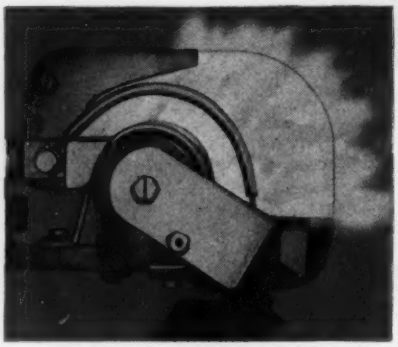

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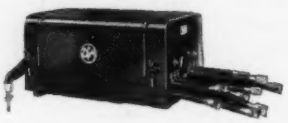

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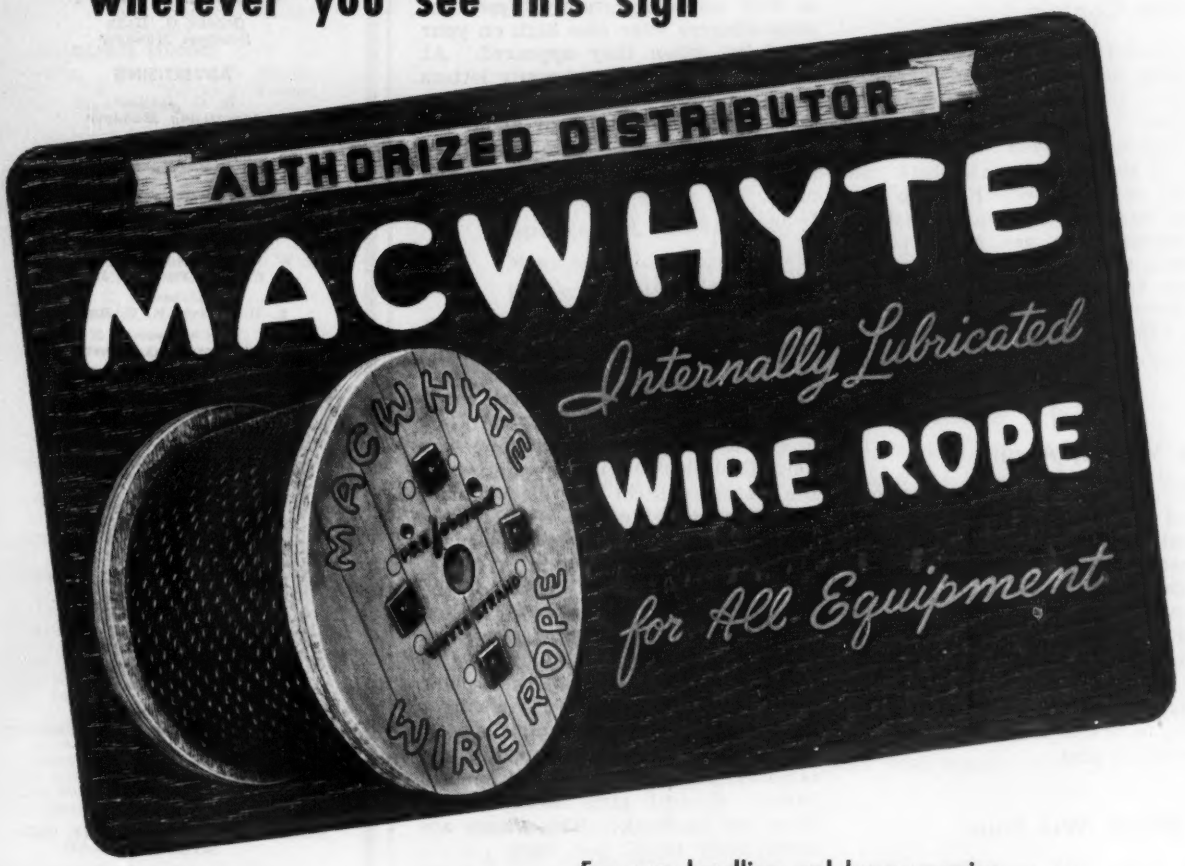


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# Behind the Scenes...

## Yachtless Captain

The business weather these days is keeping most everybody guessing. Reliable indicators are pointing downward, reliable indicators are also pointing upward. Depends on which of the reliable indicators you rely on, probably, whether you are singing the blues or quietly cashing in. Anyhow, we are going to be alarmists, at least for today, because we note from a classified ad in the *Wall Street Journal* that at least one yacht captain is out looking for a job today. An unthinkable situation, really!

## Those Weeks, Again

This, according to the calendar, is a good week for relaxing. It is national book week, and also national foot health week. So take your cue from those who know, and spend the entire week with a stack of books at your side, feet on an ottoman, shoes off, wiggling your toes in the breezes. Some of the books should be international in flavor, so you can participate in world trade week, which this week is also.

## The Editors Win Four

You folks who read STEEL week in and week out probably won't be surprised in the least to learn that the weekly stint of the editors has achieved recognition. This recognition comes in the form of awards made by a jury of experts, men who know a good editorial job when they see one. *Industrial Marketing* sponsors the annual contest, open to all business papers, and to which hundreds of separate entries are submitted each year. We're doubly proud to note that STEEL's editorial efforts took prizes in four of the classifications this year. The Yearbook won an award of merit as one of the best single issues of any business publication; "Organic Finishes", a series of articles by Allen G. Gray of our staff was adjudged among the best series of articles on a given subject; the special material on the F.O.B. mill pricing system won an award as the best original research job; and the insert of last November covering the steel industry's basic statistics was awarded a prize for being one of the best single articles. Although we are very proud and happy that the work of our editors has thus been recognized, we feel also that you readers are excellent judges as well, because certainly these four prize-winners were also high on your want list when they appeared. At least there were many, many letters from you folks attesting to that fact. This column is very happy about the while deal, of course, because we have been blowing that horn loud, long and often, and we're glad somebody else feels the same way!

## Back ½ Century

Notes on our issue of May 25, 1899: Andrew Carnegie, interviewed in London, says the American steel industry will shortly take over world markets from the British and German interests . . . also that he was paid $300,000,000 for his interest in the Carnegie Steel Co., his partners having bought him out . . . Midvale Steel Co. will build a new forge plant and an open hearth plant at Nicetown, Pa. . . . T. B. Mellon, of the Pittsburgh banking firm of A. Mellon & Sons, has been elected president of the Pittsburgh Reduction Co., which is starting to build a new plant at New Kensington, Pa. . . . Oliver Iron & Steel Co. has bought a new battery of bolt making machines and is advertising for 150 girls to operate them. Several girls have already been put to work! The wages are from $4.50 to $7 per week . . . . Illinois Steel Co. raised common labor from 13½ to 15 cents per hour. That was in 1899, remember, fifty years ago.

## Puzzle Corner

If men had been born with eight fingers and eight toes instead of ten, this would not be 1949 but instead would be 3635, because instead of the decimal system of ten units, our numbering method would be based on an eight-digit system. Here's one to wear out your pencils. A girl has a quantity of glass beads in four colors—red, yellow, green and blue. She makes them up into necklaces consisting of 20 beads each, in blocks of four beads of each color. How many different patterns can she make? She must use the beads in blocks of four of the same color, but adjacent blocks do not have to be different colors. She can make the whole necklace of a single color, or she may use two or three or four colors.

Shrdlu

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STEEL

Vol. 124—No. 21 May 23, 1949

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Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio, E. L. SHANER, Chairman and Treasurer; G. O. HAYS, President; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer. Member, Audit Bureau of Circulations; Controlled Circulation Audit, Inc.; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1949 by the Penton Publishing Co.

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# STEEL

***The Magazine of Metalworking and Metalproducing***

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★ Denotes Regular Features.

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# Clever Scheme

Some bright minds in Washington have hit upon a clever way of easing the administration and the 81st Congress out of the embarrassing fiscal mess in which they are jointly implicated.

The background of the situation is clear-cut. The President has stood firm for an increase in corporation taxes and a continuation of free spending. Congress is beginning to talk economy but until recently it has spent recklessly. Now, with business declining, the wiser heads in Washington know that taxes should not be raised and that spending should be curtailed sharply. However, their realization of these truths comes too late to avoid a deficit. What to do about it?

The tricky solution now proposed is to require substantial taxpayers, such as corporations, estates, trusts and non-resident aliens, to pay their entire taxes for 1949 in two installments during the first six months of 1950 instead of in four installments in March, June, September and December in 1950.

If adopted, this plan would bring enough additional revenue into the treasury in early 1950 to wipe out the impending deficit, enable Congress to reduce some excise taxes and to a large extent put a nice coat of whitewash over the inexcusable failure of the administration and Congress to curtail expenses. The scheme is smart from a political standpoint.

Business will view it with mixed feelings. Many industrial executives probably would welcome an opportunity to get their tax payments on a more current basis, if it could be done painlessly and at an opportune time. Most individuals are better off now on the pay-as-you-go basis than they were when their payments were a year behind. As a principle, current payment of taxes is beneficial for corporations and individuals.

However, the present foxy move is not dictated by high principle. It springs from motives of deceit. Also it calls upon corporations to double their tax payments at an extremely inopportune time. It can work severe hardship on many companies.

A better procedure would be for Congress to do some budget chopping before it adjourns and to work out a plan for placing tax payments on a more current basis at a time when business is expanding instead of contracting.

* * *

**NONINTEGRATED MILLS:** Advent of the buyers' market has brought into sharper focus one new and two traditional problems of nonintegrated steel mills.

The new problem concerns mills which were brought by hard-pressed consumers to insure a supply of steel during the recent shortage. Now that supply has caught up with demand, some of these new owners of nonintegrated properties are thinking seriously of getting out of the steel business. The disposition of these properties will be watched with interest.

One of the old problems is that of supply of semifinished steel. Most of the large integrated steelmakers who sold sheet bars before the war have withdrawn from this market. Other smaller producers have semifinished for sale and it is probable that the requirements of nonintegrated mills can be met.

The second old problem is that of competition. The nonintegrated mill which buys semifinished and sells its finished product against the competition of integrated mills is at a distinct disadvantage on price. However, by virtue of spe-

(OVER)

# AS THE EDITOR VIEWS THE NEWS

cialization, it may render a superior service which offsets the price factor.

These problems revive the old question as to whether or not the nonintegrated mill is doomed. We do not think it is. Every unit in the steel industry, regardless of size, would profit from an industry structure in which the service of the giant integrated producers was supplemented by that of efficient nonintegrated specialists. —p. 62

* * *

**MORE PRODUCTS NEEDED:** C. M. White, president of Republic Steel Corp., last week made some pertinent remarks to a group of newspaper and magazine editors which merit repeating.

He declared that the nation's steel capacity, instead of being too small, as some critics have charged, soon will be too big unless an increasing number of new products are developed and placed within financial reach of millions of consumers. A requisite for the development of these new products is a business and economic atmosphere in which a person is not punished for making money honestly. Heavy taxation, he said, limits availability of risk capital or discourages investment of available capital in ventures that would bring forth invention and development of new products.

This reasoning is sound and most businessmen know it, yet probably a majority of the people's representatives in Congress think it is good politics to hamstring industry and to discourage investment in its enterprises. Think of what a salutary effect a reversal of this attitude would have in the present state of business uncertainty! —p. 62

* * *

**RESOURCES IN ALASKA:** Secretary of Interior J. A. Krug has sent a report to President Truman in which Alaska is hailed as a new land of opportunity. He reports that during the past two years, the government has put down the foundation for "an economic and military fortress" in the territory.

Undoubtedly the development of Alaska will be hastened considerably by the new importance it has assumed as a strategic air base as a result of repercussions of World War II. This new role requires expansion of transportation and communication facilities at a much faster rate than otherwise would have been justified.

These developments in turn will facilitate a more thorough exploration of the territory's resources, which are believed to be extensive. As a result, we may have new information soon as to coal, oil, lead, zinc, nickel, tungsten, tin, graphite, iron and other minerals now undeveloped in Alaska. —p. 70

* * *

**SEEK FACE-SAVING OUT:** This week's "Mirrors of Motordom" presents a number of angles on the Ford strike which help to explain why settlement of the dispute has been delayed so long. This current work stoppage is the longest the company has ever experienced, even including the organizing drive in 1941.

Apparently the Ford position resolves itself to management's right to specify reasonable work schedules and to the integrity of a union contract. The union's position, regardless of how it is described by union spokesmen, apparently is a confusion of internal politics and jurisdictional technicalities. There are some indications that the strike could be settled if some spectacular out could be found which would save face for the rival union forces.

Meanwhile the affair at Detroit has brought real hardship to communities where suppliers' plants provide a substantial portion of local employment. —p. 75

* * *

**HOW PLATES ARE MADE:** Sixth in this publication's series of articles on the fundamentals of steelmaking is a treatise on the production of plates. The author is W. Louis Bunting, superintendent of plate mills, Lukens Steel Co.

Mr. Bunting traces the history of plate making in the United States from a pioneer iron slitting mill established in Chester County, Pa., about 1793 to the present day high speed units. He outlines in nontechnical language all of the essential operations from ingot to finished product and describes in detail a few of the nation's outstanding plate mill installations.

Readers of this authoritative article, the first installment of which appears in this issue, will be impressed by the manner in which constantly improved steelmaking and rolling processes and equipment have increased the size and improved the quality of plates available to plate users. Without these advantages, some of the nation's important industries, such as petroleum, chemical and transportation equipment, would be severely handicapped. —p. 114

E. L. Shaner

EDITOR-IN-CHIEF

# News Summary

**HOW'S BUSINESS?**—Trend toward more competitive markets continues. Steel ingot output has been edging downward since March (p. 61), as a result of shrinking demand. At industrial conventions, the return of a buyers' market is freely admitted and emphasis is placed on revitalized sales efforts (p. 65). Businessmen generally, however, expect that volume will continue good and acknowledge that this is possible even with fairly substantial reductions from the abnormal postwar demand. Largest current threat to good business lies in labor unrest and work stoppages. Strikes at key plants (p.75) now are fanning out to cause unemployment, and loss of wages and purchasing power.

**NONINTEGRATED MILLS**—Return of competition in steel sales again brings to the fore the problems facing the nonintegrated steel mills (p. 62). During the period of acute steel shortage, these plants were hard put to obtain semi-finished material. Now they can get all the steel they need, but must meet the competition of the larger mills, where they often are at a cost disadvantage. While some of the hand sheet mills probably will fade from the picture, the majority of nonintegrated mills are specializing in products not made by the big mills, performing special services for their customers, and otherwise carving out a substantial niche for themselves.

**FEDERAL FINANCING**— Many a business man must shake his head in wonder and despair at the fiscal thinking of federal government officials. The President stubbornly insists (p. 68) that taxes must be increased. Proposals to curtail expenditures apparently stand little chance of adoption. But a plan currently being pushed by administration leaders takes the cake for sleight-of-hand financing. This scheme would compel corporations to pay their 1949 taxes in the first half of 1950, instead of spreading them over the year and thus increase federal receipts in fiscal 1950 $4.6 to $4.8 billion. This would prevent temporarily the indicated deficit, and create the illusion of a surplus. Actually, the plan only delays the day of reckoning.

**AIRCRAFT REVIVAL**— Metalworking industries are beginning to benefit from the revival of activity in the aircraft industry, in the doldrums since the end of the war. Stimulus provided by the 70-group air force program (p. 64) is reaching material suppliers, tool vendors and subcontractors.

**PENSIONS**— Despite the fact that pensions are excluded from 1949 negotiations by basic steel labor contracts, the United Steelworkers-CIO is asking that retirement benefits be placed on the agenda of bargaining conferences to start in June (p. 63). Prevailing legal opinion is that the union does not have a leg to stand on unless the companies voluntarily agree to include pensions as a bargaining topic. But indications are that the steelworkers will use this year's negotiations as a sounding board for the union's pension arguments.

**EUROPE**—Labor productivity in Western Europe, excepting Germany, rose an estimated 9 per cent in 1948 and made possible boosting production (p. 71) to well above 1938 levels. Another sharp gain is anticipated for 1949.

**HERE AND THERE IN INDUSTRY**—Kaiser Co. Inc. has moved up its time table for completion of new steel facilities (p. 67) and now expects to have them all in operation by Jan. 1 . . . Rotary Electric Steel (p. 72) is completing a substantial expansion program to better serve the auto and allied industries . . . U. S. Steel Supply Co. has opened its new warehouse at Cleveland (p. 78), covering 167,000 sq. ft. . . . No new shortages of strategic materials will result from the military aid program (p. 63), according to the National Security Resources Board . . . Zinc residue, dumped at a Canadian mine for 19 years, will be salvaged with the help of newly-developed equipment (p. 78) . . . Keller Motors Corp. plans to introduce a new 4-cylinder light car (p. 76) . . . . Studebaker Corp. last week contracted with Borg-Warner for manufacture of a torque-converter type of automatic transmission to be installed on 1950 models late this year . . . . Department of Commerce has suspended pig iron allocations.

*Engineering News, p. 89* *Market Summary, p. 145*

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# Steel Output Trends Downward

**Shrinking demand forces slow but steady curtailment in mill operations. Buyers seek steel from nearby mills, to avoid paying heavy freight charges**

SHRINKING demand is forcing a slow but steady curtailment in steelmaking operations. In evidence since the week ended Mar. 26, when the steel industry operated at more than 102 per cent of capacity, the downtrend is the first in nearly five years to be attributed to lack of demand. Other recessions in steel output since the end of the war have been caused by steel and coal strikes and occasionally by scarcity of raw materials.

Buyers are now taking steel from nearby mills, to minimize freight charges. As a result, midwestern mills are operating at higher levels than those more remote from the concentration of metalworking industries.

Continued tapering of steel production through the summer months generally is expected. With the exception of passenger automobile builders, most of the large users of steel are operating at a lower level than they were six months or a year ago. The abnormal demand for steel that featured the early postwar period largely has been satisfied and for the foreseeable future, steel production should be adequate to supply demand. Proponents of large-scale expansion of steelmaking facilities, with government financing, will have little basis for their arguments in the months to come.

**Records Set in 1949**—Surprisingly enough, the steel industry established alltime production records in the early months of this year—after its major customers already were experiencing a recession in business. During March, steel output hit an alltime high of 8,387,927 tons. First quarter production also set a record at 24,052,146, with mills operating at an average of 101.5 per cent of capacity. Although April dropped off slightly, output for the first four months totaled 31,835,953 tons, 100.7 per cent of capacity, or at an annual rate of 96.8 million tons.

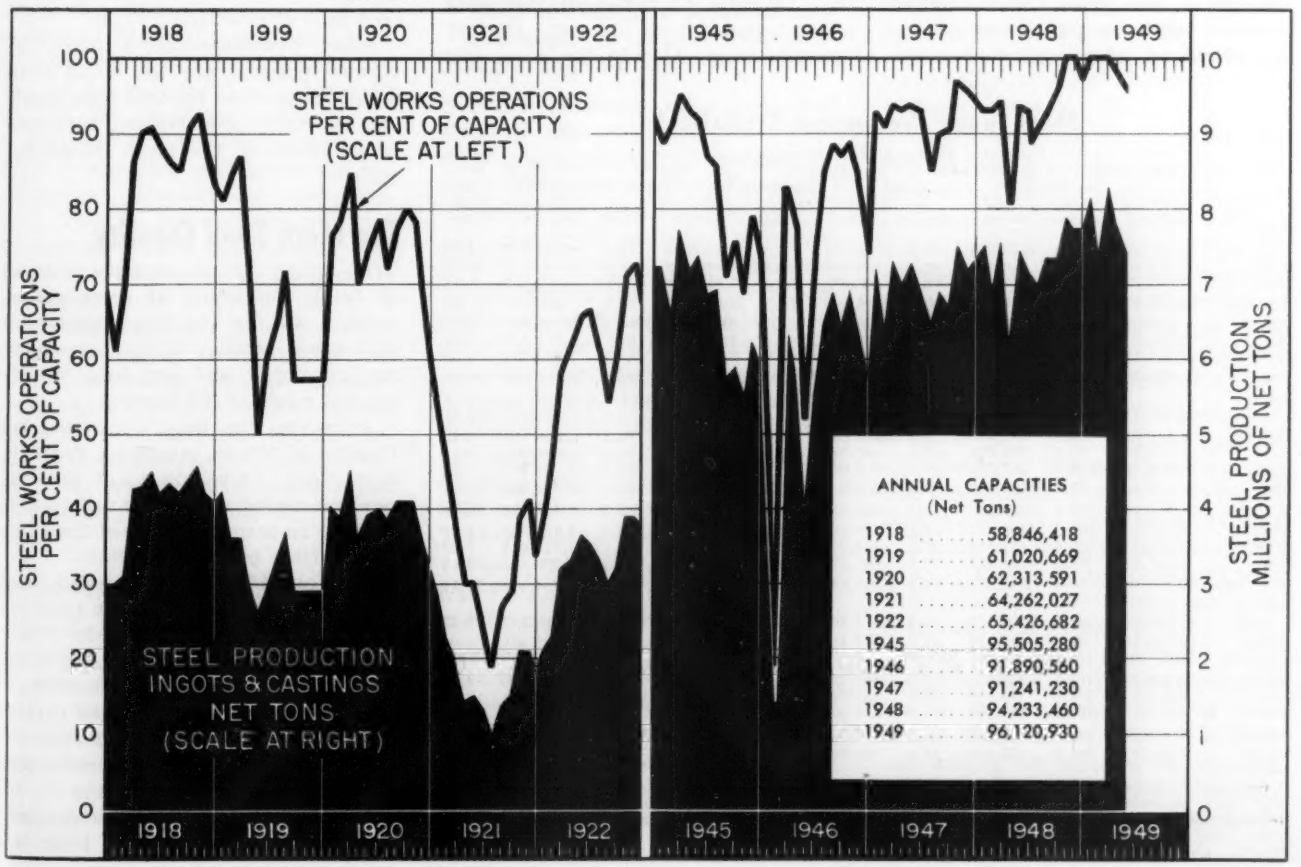
Operations have been sustained at near-capacity levels for a longer period following World War II than after World War I. In less than three years after the armistice in 1918 steel mill operations skidded to below 20 per cent of capacity. (see chart below).

**National Product Down**—One index of the extent of the recession in business during the first quarter this year is the drop in gross national product (goods and services) to an annual rate of $256 billion, off $9 billion from the preceding quarter. First quarter production, however, was still $1 billion above the average for 1948, the highest year on record.

Recent business reports have not shown the improvement which some observers hoped for. Seasonal influences have caused some improvements, notably in construction and improved automobile sales, but the over all betterment has been a little disappointing.

Price reductions continue to ap-

**STEEL MILL OPERATIONS—AFTER TWO WARS**



pear in industrial and consumer goods.

Although the rise in unemployment has been checked since early March, the upturn in number of jobs is less than might be expected seasonally. Announcements of layoffs in industrial plants exceed notices of callbacks and new hiring.

**Metalworking Executives Hopeful**—Notwithstanding the return of competitive conditions in virtually all lines, executives of metalworking companies are optimistic over prospects for business over the remainder of 1949. In a survey conducted by STEEL, nearly two out of three expect their volume to be maintained at present levels or to improve during the summer and fall months. A number point out the present availability of steel, for the first time since the war, is enabling them to work at a higher level of capacity than has been possible heretofore. Many report substantial backlogs.

**Eyes on Labor**—Many believe that labor holds the wheel which may direct the course of business. Should stoppages called by unions to support demands for wage increases and social security benefits or for trivial grievances become widespread, metalworking executives see plenty of trouble ahead.

Should the unions be successful in forcing higher employment costs—either wages or insurance-pensions—at a time when industry is shaking out prices, the price trend may be reversed and more potential buyers forced out of the market.

## Nonintegrated Producers

### Facing stiffer competition from larger mills. Some offer special services and products

WHAT does the return of competitive markets in steel hold for the nonintegrated mills?

During the postwar steel shortage, the nonintegrated mills were hard put to obtain sufficient tonnage of sheet bars, hot coils, hot bars, wire rods and other semifinished material. Some had to resort to extraordinary practices to obtain steel.

Now that the pressure on the integrated mills has eased, the nonintegrated plants can obtain plenty of steel. But they now must meet competition of the larger finishing mills of the integrated producers, which have a cost advantage.

**Hand Mills Doomed?**—While the doom of the hand sheet mills has been freely predicted for years, a number have managed to hang on. During the postwar scramble for steel, some of these were bought up by consumers to provide badly needed though expensive sheets.

The larger integrated mills have tended to drop out of the sheet bar market. Republic Steel withdrew from this market some years ago. Jones & Laughlin and Carnegie-Illinois are out of the market and indicate no intention of returning. Allegheny Ludlum is seeking sheet bar business as result of increased steel output from its new electric furnace shop. Also in the sheet bar field are Portsmouth Steel, Newport Rolling Mill, Copperweld Steel, Empire and Sharon.

With steel more freely available from the big mills, reports of impending sale or closing of the hand mills are heard with increasing frequency. A foreign government is said to be interested in one Pennsylvania hand mill. Operators of other small sheet mills have indicated they will withdraw from the steel business as soon as an adequate sheet supply from the integrated mills is assured and that the units purchased after the war would be either sold or closed.

Hudson Motor Car Co. is expected to terminate sheet production at its subsidiary Valley Mfg. Co.'s New Castle, Pa., plant about mid-July when present sheet bar stocks will be depleted. R. W. Jackson, vice president, told employees the Valley hand mills can't compete with integrated producers.

Phoenix-Apollo Steel Co., Apollo, Pa., discontinued sheet bar breakdown operations last week and is expected to complete all finishing operations by July 1. Since most of its affiliated company customers are in the Chicago area, freight charges involved would make delivered prices prohibitive in view of the growing easing in sheet and strip supply. Even if sheet bars could be obtained at lower prices to permit production at competitive price levels, freight charges involved would make delivered prices prohibitive.

**Many Specialize**—In a more favorable position are the small strip mills. These often produce high grade and specialty products not commonly produced by the large integrated mills.

## Too Much Steel Capacity

THE nation's steel capacity, instead of being too small, as some critics charge, will be too large unless an increasing number of new products are developed and put into the financial reach of the masses.

Such was the belief expressed by Charles M. White, president, Republic Steel Corp., Cleveland, to 28 newspaper and magazine writers and editors making an inspection trip of the company's Ohio plants last week.

A requisite for the needed new products is, he pointed out, a business and economic atmosphere in which one is not punished for making money. Heavy taxation, he explained, now limits availability of risk capital or discourages investment in ventures that would bring forth invention and development of new products.

**Business Not Bad**—At the moment, however, business doesn't look too

### Steel Ingot Production Statistics*

| | Estimated Production—All Companies | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Open Hearth | | Bessemer | | Electric | | Total | | Calculated weekly production | Number of weeks in mo. |
| | Net tons | Per cent of capac. | Net tons | Per Cent of capac. | Net tons | Per cent of capac. | Net tons | Per cent of capac. | Net tons | |
| 1948 | | | | | | | | | | |
| Jan. .... | 6,770,831 | 95.6 | 343,263 | 77.5 | 366,784 | 80.2 | 7,480,878 | 93.7 | 1,688,686 | 4.43 |
| Feb. ... | 6,247,491 | 94.4 | 340,689 | 82.3 | 359,837 | 84.2 | 6,948,017 | 93.1 | 1,678,265 | 4.14 |
| Mar. ... | 6,845,777 | 96.6 | 363,334 | 82.0 | 409,659 | 89.6 | 7,618,770 | 95.4 | 1,719,813 | 4.43 |
| 1st qtr. . | 19,864,099 | 95.5 | 1,047,286 | 80.6 | 1,136,280 | 84.7 | 22,047,665 | 94.1 | 1,695,974 | 13.00 |
| Apr. ... | 5,640,273 | 82.2 | 185,140 | 43.2 | 399,074 | 90.1 | 6,224,487 | 80.5 | 1,450,929 | 4.29 |
| May ... | 6,801,633 | 96.0 | 355,659 | 80.3 | 423,350 | 92.6 | 7,580,642 | 94.9 | 1,711,206 | 4.43 |
| June ... | 6,484,114 | 94.5 | 356,907 | 83.2 | 424,228 | 95.8 | 7,265,249 | 94.0 | 1,693,531 | 4.29 |
| 2nd. qtr. | 18,926,020 | 91.0 | 897,706 | 69.0 | 1,246,652 | 92.8 | 21,070,378 | 89.9 | 1,619,552 | 13.01 |
| 1st 6 mos. . | 38,790,119 | 93.3 | 1,944,992 | 74.8 | 2,382,932 | 88.8 | 43,118,043 | 92.0 | 1,657,749 | 26.01 |
| July ... | 6,348,611 | 89.8 | 325,080 | 73.6 | 401,826 | 88.1 | 7,075,517 | 88.8 | 1,600,796 | 4.42 |
| Aug. ... | 6,633,443 | 93.6 | 371,306 | 83.8 | 442,085 | 96.7 | 7,446,834 | 93.3 | 1,681,001 | 4.43 |
| Sept. ... | 6,594,499 | 96.3 | 387,259 | 90.5 | 443,086 | 100.3 | 7,424,844 | 96.2 | 1,734,777 | 4.28 |
| 3rd. qtr. | 19,576,553 | 93.2 | 1,083,645 | 82.6 | 1,286,997 | 95.0 | 21,947,195 | 92.7 | 1,671,530 | 13.13 |
| 9 mos. . | 58,366,672 | 93.2 | 3,028,637 | 77.4 | 3,669,929 | 90.8 | 65,065,238 | 92.2 | 1,662,372 | 39.14 |
| Oct. .... | 7,120,753 | 100.5 | 409,657 | 92.5 | 466,485 | 102.0 | 7,996,895 | 100.1 | 1,805,168 | 4.43 |
| Nov. ... | 6,925,043 | 100.9 | 411,161 | 95.9 | 461,354 | 104.2 | 7,797,558 | 100.8 | 1,817,613 | 4.29 |
| Dec. ... | 6,927,689 | 98.0 | 393,717 | 89.1 | 459,373 | 100.7 | 7,780,779 | 97.7 | 1,760,357 | 4.42 |
| 4th qtr.. | 20,973,485 | 99.8 | 1,214,535 | 92.5 | 1,387,212 | 102.3 | 23,575,232 | 99.5 | 1,794,158 | 13.14 |
| 2nd 6 mos. . | 40,550,038 | 96.5 | 2,298,180 | 87.5 | 2,674,209 | 98.6 | 45,522,427 | 96.1 | 1,732,867 | 26.27 |
| Total .. | 79,340,157 | 94.9 | 4,243,172 | 81.2 | 5,057,141 | 93.7 | 88,640,470 | 94.1 | 1,695,495 | 52.28 |
| 1949 | | | | | | | | | | |
| Jan. ... | 7,287,683 | 101.1 | 408,552 | 92.6 | 487,260 | 93.8 | 8,183,495 | 100.2 | 1,847,290 | 4.43 |
| Feb. ... | 6,633,779 | 102.0 | 379,698 | 95.3 | 467,247 | 99.6 | 7,480,724 | 101.4 | 1,870,181 | 4.00 |
| Mar. ... | 7,473,901 | 103.7 | 430,176 | 97.5 | 483,850 | 93.2 | 8,387,927 | 102.7 | 1,893,437 | 4.43 |
| 1st qtr. . | 21,395,363 | 102.3 | 1,218,426 | 95.2 | 1,438,357 | 95.4 | 24,052,146 | 101.5 | 1,870,307 | 12.86 |
| †Apr. .. | 7,017,389 | 100.6 | 404,095 | 94.6 | 362,323 | 72.0 | 7,783,807 | 98.4 | 1,814,407 | 4.29 |

* Revised. † Preliminary figures subject to revision.
For 1949, percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of Jan. 1, 1949, as follows: Open hearth 84,817,040 net tons, bessemer 5,191,000 net tons, electric 6,112,890 net tons, total 96,120,930

bad, what with the high production plans of the automobile industry, the good level of output in the agricultural implement business and the rapid growth of television set manufacture, Mr. White pointed out.

Commenting on the slackening in business in some sections of the steel industry, he said that even if the nation's yearly ingot production drops to between 60 million and 80 million net tons annually, it still will be a good year.

Mr. White revealed Republic is beginning to benefit from improved quality scrap. Recently (May 14) the company closed down two of its nine open hearths at Buffalo because the higher quality of steel scrap charged into them had boosted ingot output beyond the blooming mill capacity there.

## Press for Pensions

**Steelworkers ask retirement benefits, despite contract exclusion. Cite high court ruling**

UNITED Steelworkers-CIO is asking steel producers to bargain on pensions despite the fact existing contracts limit negotiations this year to wages and social insurance.

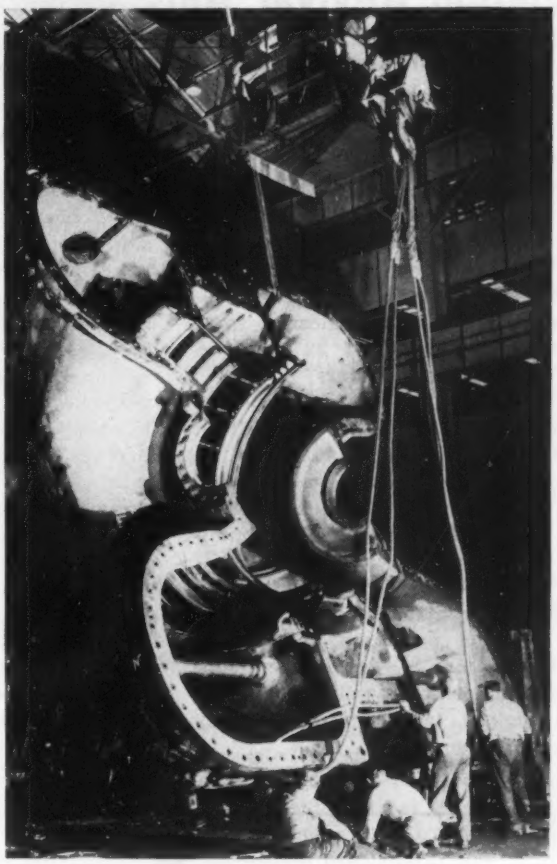
Letters were sent last week to 835 steel companies notifying them of the union's desire to reopen negotiations on wages, insurance and "pensions upon retirement or disability." Under provisions of the contracts, the companies and the union are required to begin negotiations within 30 days, or in this case before June 15. If no agreement is reached by July 16, the union can strike.

The contracts provide reopening in 1949 to negotiate only on wages and insurance. However, the union contends that the recent Supreme Court decision in the Inland Steel case obligates the employers to bargain on pensions.

Although industry attorneys hold that pensions are excluded from this year's bargaining by the contract terms, and that this year's negotiations are not affected by the Supreme Court decision, the union is expected to press its attempts to inject discussions of pensions at conferences.

## Lewis Asks Captive Mine Talks

JOHN L. LEWIS last week asked operators of steel company coal mines to open discussions on a new contract. Current contracts expire June 30. Traditionally, the miners have refused to work without a contract. Mr. Lewis' request for negotiations gave no indication of the miners' demands.



EXHAUST-HOOD: Weighing 77 tons, this exhaust hood for a 150,000-kw steam turbine is reversed for finishing operations in General Electric's Schenectady Works. Turbine-generator of which this is a part will produce enough electricity to meet needs of 300,000 people

## Military Aid Program

**Held not likely to result in new shortages of critical and strategic materials**

NO new shortage of critical and strategic materials will result from the European military assistance program now under study by Congress.

This is the considered opinion of the National Security Resources Board. Allowing a safety factor, the NSRB studied the impact of a program somewhat larger than that proposed by the President which, as presented by Secretary of State Acheson before the Senate Foreign Relations Committee in April, calls for $1.13 billion for rearming the North Atlantic Treaty nations plus $320 million for arms aid for Greece, Turkey and possibly other countries.

**Three Metals Studied**—The study was directed at the three metals most widely used in producing military materiel,—steel, copper and aluminum. John R. Steelman, acting director of NSRB, reported as follows:

"Military aid requirements are small in relation to total availabilities. They are also of minor significance in relation to the requirements of all proposed security programs. Requirements for all security programs for steel and aluminum will amount in each case to a little over 6 per cent of the estimated United States supply. For copper, such requirements amount to considerably over 15 per cent.

"All foreign aid requirements, including military aid, amount to less than 2 per cent for steel, less than one-quarter per cent for aluminum, and somewhat over 4 per cent for copper for which ECA program requirements are sizable. The military aid requirements amount to less than one-half of one per cent of the total supply of each of the three metals.

**Impact Discussed**—"The problem of the impact of the military aid and other security program requirements was discussed at a meeting of representatives from interested federal agencies. It was the general judgment of the group the increased burden caused by the military aid program would be manageable.

"The burdens on the three basic metals created by the requirements for all the projected security programs, while much larger, could be met within the limits of the supplies estimated to be available to the United States without any real hardship on the domestic economy."

# Aviation Revival Aids General Industry

## Effects of Congressional appropriations made in 1948 for military aircraft beginning to be felt in general metalworking field in the form of subcontracting work

GENERAL metalworking companies are beginning to benefit from renewed economic health of the aircraft industry, now out of the oxygen tent after government ministrations. This is the consensus gleaned from a survey by STEEL of 22 airframe and engine manufacturers.

Congress in 1948 prescribed potent medicine, $3.1 billion for fiscal 1949, in its first-year appropriations for the 70-group air force and naval aviation. The effect of this stimulus was felt by the aviation industry beginning last year, and the general metalworking field is feeling direct benefits now through subcontracting work awarded by airframe producers and federal contracts for the government-supplied equipment on military aircraft like engines, instruments and many other components.

**Subcontracting**—Prior to the defense program, airframe producers subcontracted about 5 per cent of their business. This proportion is now higher, particularly among the larger companies. On recent contracts approximately 50 per cent of Boeing Airplane Co.'s work normally performed by the prime contractor has been subcontracted. The industry average, however, is still below the estimated 25 per cent subcontracted during the war. Reasons for the smaller ratio are that aircraft producers are now more completely integrated and that relatively more equipment is now government-furnished than formerly.

In the area of government-furnished equipment, general metalworking firms are finding their greatest opportunity. During testimony on appropriations bills last year regarding the 70-group air force, it was revealed that 52.8 per cent of the price of the program would go to airframe makers (who in turn would pass part of this, at least 5 per cent, on to their subcontractors) and 47.2 per cent would go to producers of the government-supplied equipment.

General metalworking firms are beginning to benefit indirectly, too. Mounting aircraft sales volumes will aid raw material suppliers, tool and die shops, machine tool builders and other segments of industry that deal with aircraft company suppliers, not with the plane makers directly. The 12 major airframe companies may do business totaling more than $1 billion in 1949, or nearly double the 1946 total. Net sales of 12 major producers for representative years, as compiled by Aircraft Industries Association of America, are as follows (in millions of dollars), with 1949 estimated:

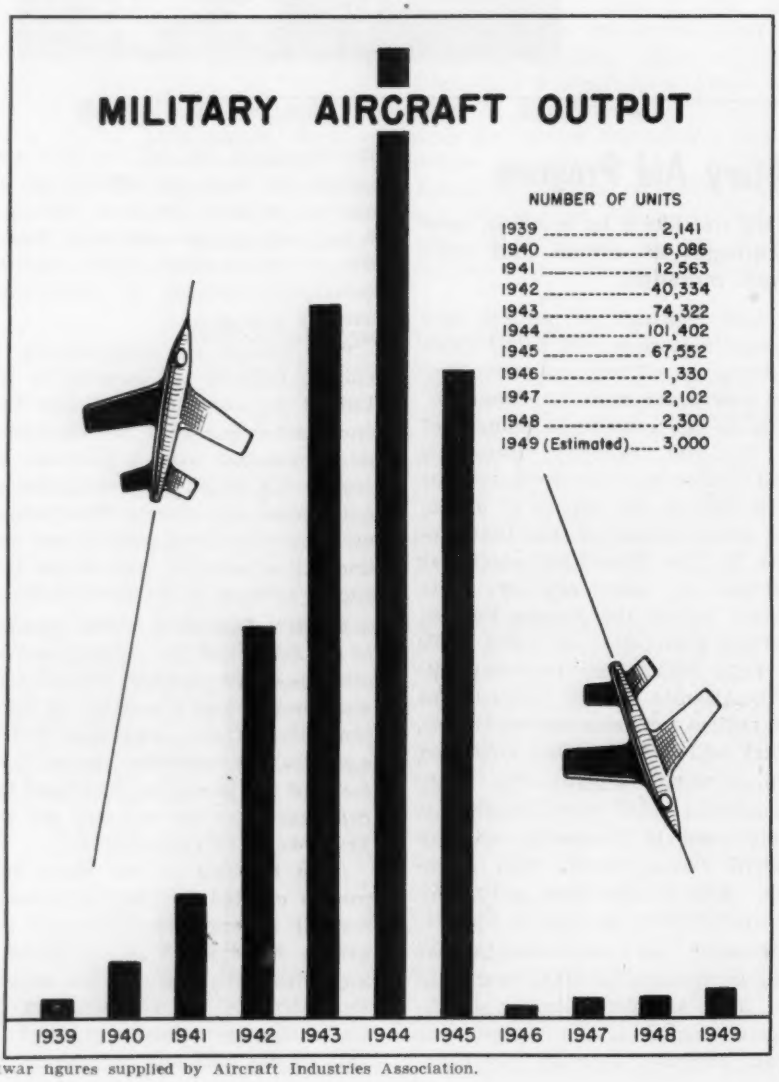
| | | | |
|---|---|---|---|
| 1937 | 61.8 | 1947 | 545.0 |
| 1945 | 3965.3 | 1948 | 844.4 |
| 1946 | 519.0 | 1949 | 1000.0 |

**Aircraft Health Uncertain**—The aircraft industry, however, is still far from robust in health. It operated at a loss in 1946 and 1947 and last year made a profit of only 1.42 per cent of sales. Its per cent of profit to sales was 7.6 in 1937.

An estimated order backlog of $2.7 billion in the aviation field should be excellent reserve strength, but Aircraft Industries Association points out that this figure does not represent the amount of work on orders still to be executed, but total orders which have not yet passed through the sales account. Furthermore, the backlog indicates a production volume for two or more years, not one year or less as in the case of most industries, because aircraft orders may take from one to three years, or even longer, to complete. In addition, aircraft backlogs are unusually subject to cancellation because of government budget cuts, changes in appropriations or specification shifts.

Appropriations for the first year only of the 70-group air force and 14,500-plane naval aviation programs have been passed by Congress. The House has approved a fiscal 1950 appropriation of $1.1 billion in cash and $1,992,755,000 in contract authorizations for 2550 aircraft. The bill has not yet been acted upon by the Senate Appropriations Committee. The sum allotted by the House would be sufficient to continue planning for a 58-group force, but not for the original 70-group air arm.

**Volume Output Beginning**—The in-




Postwar figures supplied by Aircraft Industries Association.

dustry only now is completing its tooling program and other preparations and is just beginning to go into volume production on orders placed in 1948. Some companies are dependent upon the government for nearly 100 per cent of their business. Aircraft's military contracts now average about 80 per cent of total volume, and the proportion is rising. In 1937, military business accounted for 57.5 per cent of the total volume. Output of military aircraft for the past ten years is shown in the table on the opposite page.

Production in 1949 of commercial units is expected to fall below the level in 1948 when 170 airline transports, 70 executive-type planes and 7300 personal aircraft were turned out. In 1947, 280 commercial and executive-type units and 15,515 personal aircraft were produced.

## Furnace Men Optimistic

### Competition returning but business prospects promising, manufacturers told at convention

NOBODY can deny that competition is coming back, but, at the same time, prospects for business may be regarded optimistically, C. H. Stevenson, outgoing president of the Industrial Furnace Manufacturers Association and vice president of Lindberg Engineering Co., Chicago, told representatives of the association's 51 members meeting at Virginia Beach, Va., May 16-18.

"The industrial furnace industry's order backlog is down to $15 million from $22 million a year ago," Mr. Stevenson said, "reflecting a greatly improved delivery situation in materials such as steel, castings, electrical equipment, valves, etc.

**New Orders Up**—"New orders in the first quarter of 1949 were ahead of the corresponding 1948 period due partly to an increase in foreign business," he said. "Total business for 1949 is expected to run only slightly under the $23.5 million reported for 1948."

W. E. Borbonus, president, R-S Products Corp., Philadelphia, was elected IFMA president, succeeding Mr. Stevenson. Mr. Borbonus said that business is faced with a new set of problems in a new business cycle. Further, he said, the lone wolf type of company now is as dead as a dodo bird. It is no longer possible to conduct a business on the basis of rugged individualism.

New directors elected for two-year terms are: Ceramic Division, H. M. Heyn, Surface Combustion Corp., Toledo, O.; Combustion Division, M.

W. E. BORBONUS

L. Snodgrass, Gas Machinery Co., Cleveland; and Oven Division, C. B. Kentnor Jr., W. S. Rockwell Co., Fairfield, Conn.

Directors carrying over for another year are: Electric Division, J. J. Walker, C. I. Hayes Inc., Providence, R. I.; Glass Division, J. Earl Frazier, Frazier-Simplex Inc., Washington, Pa.; Steel Division, F. W. Brooke, Swindell - Dressler Corp., Pittsburgh; and Burner Division, D. A. Campbell, Bryant Heater Co., Cleveland.

Production control, reduction of engineering costs, estimating methods, tax and legislative problems, accounting practices and mobilization for a possible war were included in IFMA's three-day program. The 1950 annual meeting will be held at Hot Springs, Va., May 15-17.

## Opportunities Seen

### By liquefied gas group for young industry with untapped markets in competitive economy

BEING a young industry with untapped market areas and undiscovered applications is an advantage as the economy moves into a normal and highly competitive condition. This was the tenor of many addresses at the Liquefied Petroleum Gas Association's annual convention in Chicago May 9-11.

Spokesmen cited how in the past four years the industry's annual sales had nearly trebled, that now more than five million rural homes, portions of the chemical industry and thousands of other industrial users are being served, that last year's marketed production soared to 2.6 billion gallons, its range sales reached 26 per cent of total stove sales and that a similar ratio for other LP-gas consuming appliances was believed to have been established.

**See Big Market**—What's ahead is of course more important than what's behind, and in estimating the potential household market of today and of five years hence, K. H. Koach, LPGA president, said ten million homes cook and heat water with wood, coal or kerosene, and that in the next five years the appliance requirements of

*Si G. Darling, president of Darlingas Inc., Pratt, Kans., receives congratulations on his election to the presidency of the Liquefied Petroleum Gas Association at the group's annual convention. Left to right: H. H. Torbit, K. H. Koach, retiring president, R. B. Jones, Mr. Darling and E. A. Keible. Messrs. Torbit, Jones and Keible are newly elected directors*

this undeveloped market may reach 15 to 20 million units, which in addition to appliances would require servicing equipment and fuel.

Failure of some LP-gas appliance dealers to tell prospects of the variety and advantages of LP-gas equipment were spotlighted by Lee A. Brand, vice president, Empire Stove Co., and chairman, manufacturers section, LPGA. To correct this situation a committee to prepare suitable sales training programs has been established within the organization.

From LPGA's membership of more than 600 companies, embracing marketers, equipment and appliance makers, fuel producers, etc., the annual meeting's attendance was approximately 1500. Held concurrently was a trade show with more than 100 booth exhibits, showing products ranging from containers and meters to space heaters.

Newly elected LPGA officers include: President, Si G. Darling, Darlingas Inc., Pratt, Kans.; first vice president, E. C. McEneany, Diablo Co., Walnut Creek, Calif.; second vice president, W. S. Lander, Rulane Gas Co., Charlotte, N. C. Re-elected as executive vice president was Howard D. White, as secretary, Arthur Kreutzer, and as treasurer, Walter H. Miller, Dri-Gas Corp., Chicago.

## Trade Group Directory Grows

BIGGEST trade association directory compiled to date by the government has gone to press; copies will be available sometime in June from the Commerce Department in Washington or its 42 field offices all over the country at $1.50. Written by Jay Judkins, chief of the Commerce Department's Trade Association Division, in collaboration with H. E. Wells, it lists more than 4000 trade associations, with pertinent information under each listing.

## Scrap Lull Seen as Temporary

VOICING belief that the demand for scrap metals would turn upward within a reasonable time, Edwin C. Barringer, executive vice president of Institute of Scrap Iron & Steel Inc., declares it is probable that the trade must accustom itself to steel production at normal rates of around 70 rather than 90 per cent of capacity.

Mr. Barringer addressed the Gulf Coast Chapter of the institute at its May 7-8 meeting at Fort Worth, Texas.

He said the unusual situation that has prevailed in the market the past several weeks could not be expected to last forever and that the mills would in the natural course of events return to purchases in quantities in conformity with fair market demands.

## Scrap Shortage Over

**American importers not expected to seek third quarter allocation of German material**

WITH the domestic scrap shortage definitely over expectations are this country will not seek an allocation of German scrap for third quarter when the Organization for European Economic Co-operation meets May 24 in Paris to establish quotas.

In the scrap trade it is pointed out that not only have scrap supplies become surplus in this country but also that German scrap costs substantially more than does metal in the open market here.

The established scrap price in Germany is $28.50 per ton at northern ports, or $26.50 at Rhine-Ruhr points. Some talk is heard to the effect military authorities are considering cutting this price $5 per ton, but it is pointed out that the price would have to be cut much more than that to again make German scrap attractive to American buyers. German scrap costs around $50 per ton delivered at Pittsburgh.

While exact figures are lacking it is estimated that currently the steel mills and foundries are holding scrap inventories in excess of five million tons and are disinterested in dealer offerings. As a result domestic scrap prices have taken a nose-dive since last summer, falling almost 50 per cent to around $23 per ton.

As reported in STEEL (May 16, p. 57) U. S. imports of German scrap have been rising due to heavy deliveries against contracts placed a year ago. Census data show imports of German material totaled 61,186 gross tons in January and 103,898 in February. Shipments against these contracts are not expected to be concluded until July or August.

## Steel Imports Rise In February

LATEST available data show imports of iron and steel products to be on the increase. Data collected by the Department of Commerce show February imports of semifinished and finished steel products totaled 54,237 net tons compared with 52,822 the preceding month. Imports of pig iron and related products during the month amounted to 38,723 tons against 45,123 in January. Scrap imports totaled 198,046 tons in February compared with 162,435 the preceding month.

Breakdown as reported by the Commerce Department follows:

| Product | January net tons | February net tons |
|---|---|---|
| Ingots, etc. | 5,999 | 5,612 |
| Wire rods | 381 | 447 |
| Iron bars, slabs | 43 | 93 |
| Concrete bars | 1,261 | 1,079 |
| Hollow bar, drill steel | ..... | 3 |
| Other bars | 2,408 | 6,300 |
| Boiler, other plate | 3,296 | 1,816 |
| Sheets, etc. | 2,418 | 7 |
| Tin plate, etc. | ..... | 1 |
| Other hoops, bands | 690 | 1,468 |
| Structurals, piling | 34,918 | 36,006 |
| Rails, fastenings | 18 | 274 |
| Pipes, tubes | 386 | 630 |
| Round wire | 1 | 6 |
| Flat wire, strip | 131 | 119 |
| Telegraph wire | 32 | 1 |
| Wire rope | 32 | 68 |
| Nails, etc. | 71 | 137 |
| Bolts, nuts | 10 | 9 |
| Castings, forgings | 16 | 5 |
| Die blocks, blanks | 325 | 156 |
| Cast iron pipe, fittings | 89 | 10 |
| Malleable pipe, fittings | ..... | 1 |
| Power trans., other chain | 12 | 7 |
| Pig iron | 34,917 | 24,297 |
| Sponge iron | 188 | 493 |
| Ferromanganese | 7,804 | 12,185 |
| Ferrosilicon | 91 | 90 |
| Ferrochrome | 449 | 223 |
| Other alloys | 1,674 | 1,435 |
| Scrap | 162,435 | 198,046 |

## Soviet Ore Exports Cut

**American receipts of Russian manganese and chrome fall for third successive month**

ALTHOUGH Russian exports to the United States increased in March, shipments of chrome and manganese to this country declined for the third consecutive month.

Data collected by the Department of Commerce show that Russia exported goods valued at $4,300,000 to this country during March, and in return this country shipped a total of $1,900,000 worth of goods to Russia. Shipments from nations behind the Iron Curtain increased to $9,400,000 while American exports to those countries dropped to $8,400,000.

Russian total exports to this country in March were up $1 million compared with exports in February, reflecting chiefly an increase in the shipment of furs. Shipments of chrome and manganese ore declined during the month more than 50 per cent, dropping to a value of $600,000 compared with $1,300,000 in February.

## Nationalization Rebuffed

EARL Lloyd George of Dwyfor, son of one of Britain's most noted statesmen, last week interpreted the Conservative election victories in England as a sign of the British people's opposition to nationalization of the steel industry.

Writing in the May *Steelways*, published by American Iron & Steel Institute, Lloyd George said the tactics of the Labor party to take over steel were offensive to the British.

## Time Table Advanced

**Kaiser expects all new steelmaking facilities to be in operation by Jan. 1**

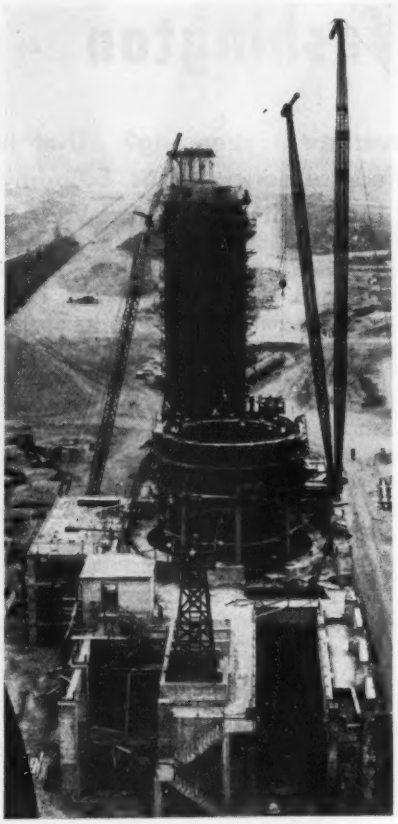
KAISER CO. INC., Fontana, Calif., has moved up its construction time table 60 to 90 days and now expects to have all of its new steelmaking facilities in operation by Jan. 1, 1950.

A new 1200-ton blast furnace is well under way and scheduled for operation around Oct. 1. This new furnace will be similar to the present stack built during the war. It will be supplemented by 45 new Koppers-Becker coke ovens with an annual capacity of 160,000 net tons. The new battery will bring the total number of ovens up to 135 with annual capacity of 515,000 tons. The two blast furnaces will be rated at 876,000 tons annually.

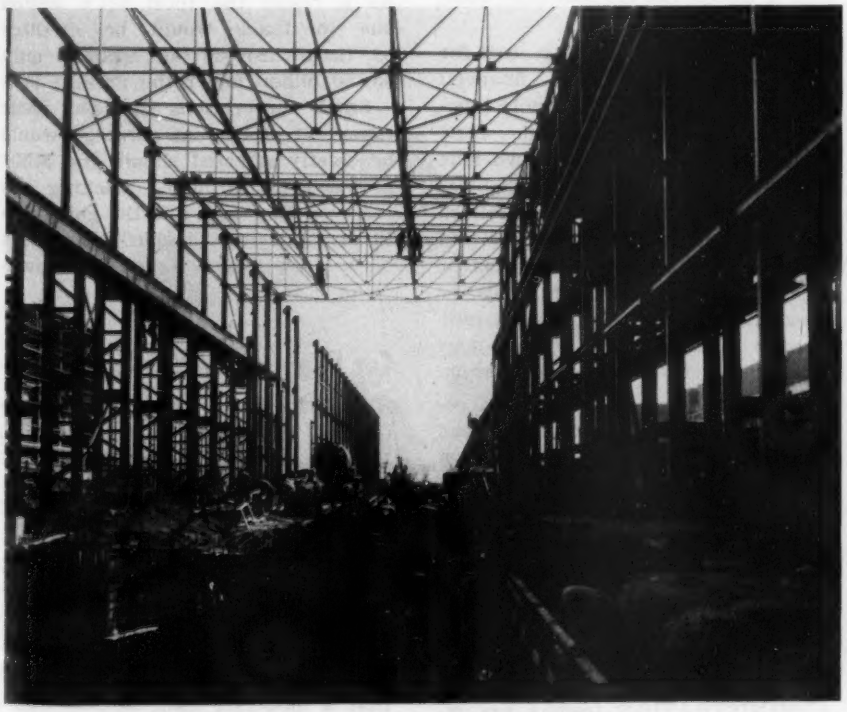
**Ingot Output Up**—A seventh 185-ton open-hearth furnace went into operation Dec. 24, 1948, bringing total annual theoretical capacity up to 980,000 tons. Actually, however, all seven furnaces have been producing an average of 210 tons per heat. A seventh 2-hole soaking pit also has been added.

A new slab heating furnace was completed two months ago and has capacity of 100 tons per hour. An existing heating furnace has been rebuilt to provide a similar tonnage.

**Strip Mill Building**—A mill building and foundations for a new United 4-stand, 4-high, 86-in. hot strip mill are nearly completed. This mill will produce hot-rolled sheets up to 76-inches wide and down to 14 gage in thickness, as well as skelp for the Fretz-Moon butt-weld pipe mill. Kaiser officials expect the strip mill to be ready for operation about Jan. 1. It will have a capacity of 60,000 tons per month. The company also has a 10-stand strip and skelp mill producing widths up to 16 in. and rated at 25,000 tons per month. Cold rolling facilities are limited to one 24-inch mill which can turn out 24,000 tons a year. Other equipment includes a 110-inch plate mill, structural and bar mills.



*Scheduled to start operation about Oct. 1 is this new blast furnace under construction at Kaiser Co. Inc. Fontana plant*



*Mill building and foundations for Kaiser's new 86-inch hot strip mill are nearly completed. Shown above are motor room basement and roll shop area. Operation may start around Jan. 1*

## Coast Steel Operations Slip

DECLINING demand is beginning to curtail operations of basic steel producers in the San Francisco area and is increasing cutbacks among larger fabricators.

In the primary mills, reductions thus far have been comparatively small, but they are seen as a hint of deeper cutbacks unless general business improves.

The slackening in demand has affected bars, structurals and wire products to greatest extent. Sheet supplies are rapidly reaching parity with demand, and some plate products are in "sufficient" supply.

Columbia Steel Co. has reduced operations in some departments of its Pittsburg nail and wire mill and rolling mill to a four-day week.

Bethlehem Pacific Coast Steel Corp. also has cut to a four-day week in the rolling mills and maintenance department of its South San Francisco plant. Pacific States Steel Co. now is operating at 75 per cent of previous levels.

California Wire Cloth Co. also has cut to a four-day week and has laid off about 60 per cent of its production workers. E. H. Edwards Co., manufacturer of wire rope, also has put in a four-day week schedule, and Enterprise Engine & Foundry Co. has reduced operations to "three or four" days a week. Mutual Engineering Co., producer of custom machinery, has dropped 37 boilermakers, machinists and helpers from its normal crew of 50.

Although seasonal food processing employment is increasing at this time of the year, the number of factory workers employed in the San Francisco area declined in April for the fourth consecutive month. Employment in April was 6800 below a year ago.

In addition to the cutbacks in steel plant operations, about 2000 production workers at Columbia Steel Co.'s Pittsburg plant walked off the job on May 12. The plant employs about 4300.

# Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

**Increase taxes or curtail government spending? That is question before Congress as federal deficit looms. Economy campaigns expected to bear little fruit before next year**

FUNDAMENTAL issue of whether increased government spending should be met by increased taxation, or whether spending should be curtailed to make a tax increase unnecessary, is still far from the decisive stage but is getting closer to it.

While President Truman stubbornly insists that taxes should be increased—that the budget he presented for fiscal 1950 represented the maximum in economy, and that there should be no difficulty in government financing in a country that has a national income of approximately $217 billion—more and more members of Congress are serving notice they do not share this opinion. This includes some outstanding leaders of his own party, particularly Sen. Walter F. George, chairman of the Senate Finance Committee, and Rep. Robert Doughton, chairman of the House Ways & Means Committee. They think the proposed tax increase should be shelved and, instead, government spending be reduced.

Expressions from thousands of constituents, and many associations and economic study organizations have helped crystallize this thinking in Congress. But the main factor is the speech by highly-respected Sen. Harry F. Byrd, the Senate's outstanding fiscal expert, which painted a dismal picture.

**Predict Deficits** — Projecting the present budget, without including new items such as the proposed broadening of the social security system, the proposed health program, the proposed Brannan perpetual farm-support program and others now under legislative consideration, reveals these deficits, said Senator Byrd: $0.8 billion in the current fiscal year; $3.4 billion in fiscal 1950, and $6.5 billion in fiscal 1951.

The situation will become extremely critical a year from now, and the prospects are bleak and fraught with grave public consequencies, said Senator Byrd, adding: "If we can't or won't run this government on a balanced budget now, I doubt that we shall ever return to sound financing."

Senator Byrd's speech, a long one which analyzed the federal financial situation in detail, has resulted in a congressional state of mind ranging from uneasiness to alarm. Will it bear fruit? Unfortunately the answer seems to be "no" as far as the immediate future is concerned; Congress has gone too far with its appropriations program this year to effect important savings in the coming fiscal year. However, as a result of some new moves in the past 10 days, there is reason to hope that some substantial economies may be made a year from now—always assuming the international situation grows no worse.

**May Consolidate Appropriations**—Most important development is introduction, with Majority Leader Scott Lucas' approval, of a Senate resolution embodying the Byrd proposal for one consolidated appropriation act next year and in subsequent years in place of the many appropriation acts now enacted each year. It calls for definitions which would eliminate the present gobbledegook meaning of such terms as deficiency and supplementary appropriations, recissions, etc. The legislative budget would be in charge of a Joint Committee on the Legislative Budget appointed on a bipartisan basis and provided, for the first time in the history of Congress, with a full-time staff of competent specialists in fiscal affairs.

Some other moves give ground for hoping that government financial matters will be handled in more businesslike style starting soon. Now on the Senate calendar are two bills that would help toward this objective. One provides for centralized control of all government buying and the other would give the President authority to promote efficiency by consolidating and reorganizing government agencies. Both embody suggestions of the Hoover commission.

Just how much in the way of results can be expected from these and other moves now under consideration remains to be seen. They do show, however, that Congress is getting scared over the continued ever increased spending. That is a favorable sign.

## Fiscal Sleight-of-Hand

ADMINISTRATION leaders are reported warmly suporting a tax bill proposed by Representative Wilbur D. Mills (Dem., Ark.) which would shorten the tax payment period of corporations by six months, and, incidentally (?) provide an out from the dilemma of balancing the national budget for fiscal 1949-50 without effecting economies in government expenditures or boosting taxes.

This proposal of Representative Mills would increase corporation tax receipts for fiscal 1950 from $4.6 to $4.8 billion, offsetting a $2.9 billion deficit forecast by experts of the Ways & Means Committee of the House, and at the same time result in a surplus of $1.7 billion which could be applied for debt reduction.

Here's how the sleight-of-hand would be worked. Corporations would be compelled to pay most or all of their taxes on 1949 calendar year earnings during the first six months of 1950 instead of spreading payment throughout the entire year as at present.

Under the present law corporations pay their 1949 income taxes in quarterly installments in 1950, payment dates being Mar. 15, June 15, Sept. 15 and Dec. 15. Estimates place 1949 corporate income taxes at $11.5 billion, payment of only half of which would be credited to 1949-50 government revenues.

The Mills' plan would change this to require corporations to pay all of their taxes in the first six months of the year, on Mar. 15 and June 15. As a result the total $11.5 billion due in taxes would be credited to fiscal 1949-50 as against only $5.750 billion under the present law.

Small corporations that pay their taxes out of current earnings would be chiefly affected should the Mills' proposal go through. Lacking tax reserves they may find the going difficult in paying "double" taxes at a time when income is on the downtrend.

## Cut Expenditures, Advises CED

REDUCTION or postponement of federal expenditures during fiscal 1950 is advised by the Research & Policy Committee of the Committee for Economic Development in a statement on national policy.

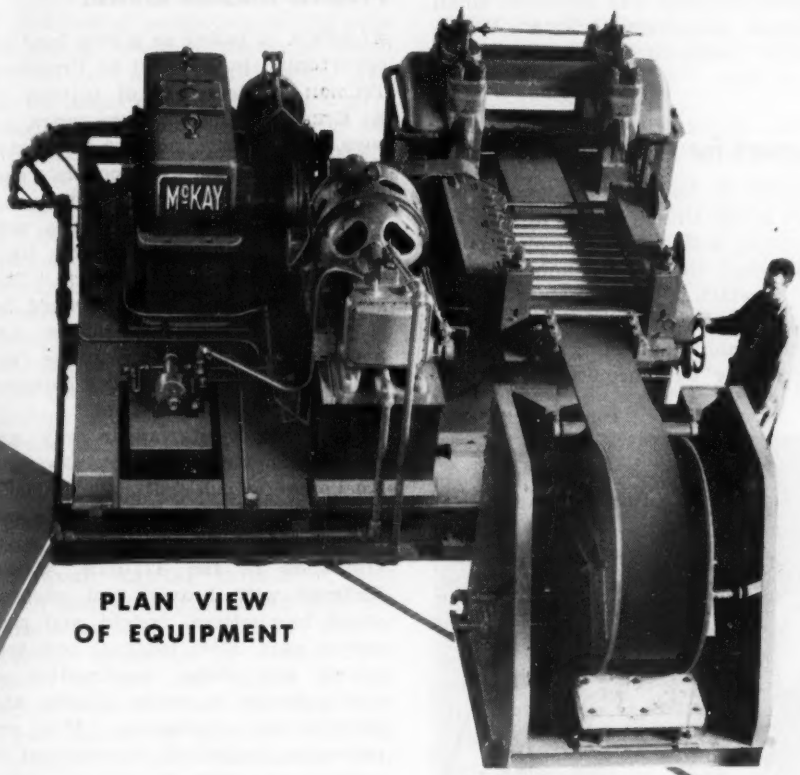
Expenditure proposals now before Congress confront the country with the necessity of choosing between three courses of action:

1. To hold expenditures down—so that a moderate cash surplus would be yielded by existing tax rates under conditions of high employment.

2. To allow expenditures to rise and

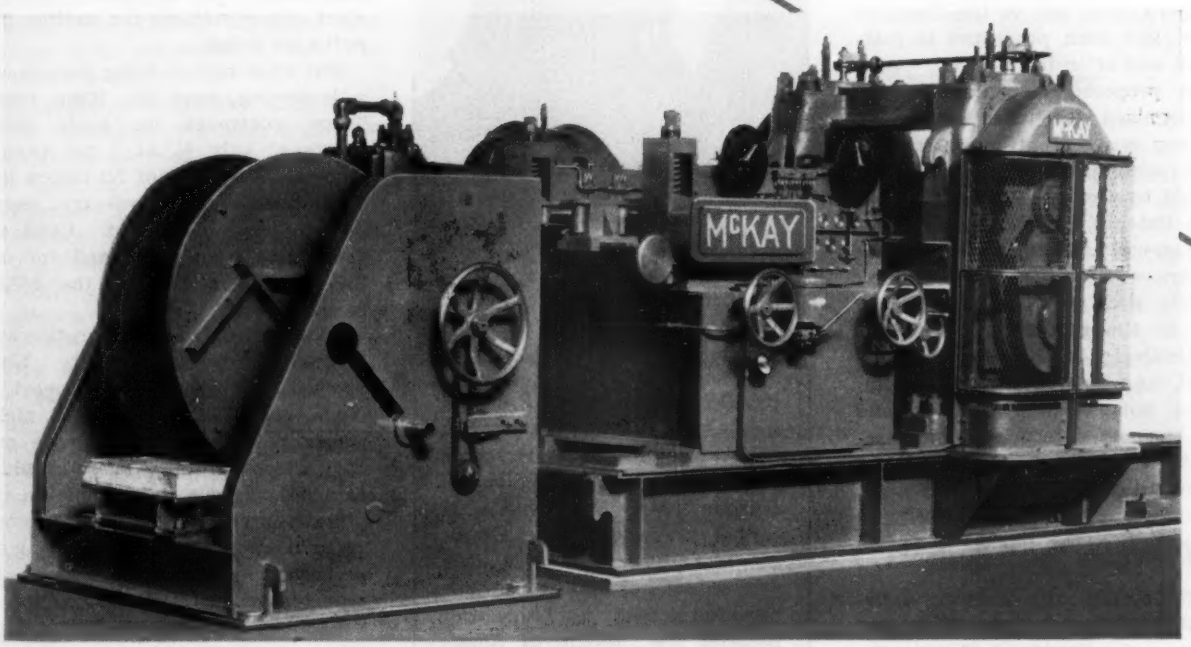
# McKAY

## *Will cut it* CLEANER *and do it* FASTER




**PLAN VIEW OF EQUIPMENT**

- A Roller Leveler and Rotary Drum Type Shear, (Utilizing Geneva Motion) are combined to produce cut to length strip from the coil.
- Extreme accuracy is developed through use of fluid drives and differential hydraulic speed control.
- Delivery speed 100 to 300 feet per minute.
- Lengths are variable from 2 to 20 feet.
- Compact design minimizes floor space.
- Rugged construction insures continuous performance.
- Leveler capacity 16 gauge to 1/4" thickness — SAE 1020 steel.
- Shear capacity 1/8" x 24" or 1/4" x 12" — SAE 1020 steel.
- Engineered for low cost high speed production.




*The* **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

increase tax rates—so that tax revenue would cover the increased expenditures plus a moderate cash surplus at high employment.

3. To allow expenditures to rise and not to increase tax rates—so that there would be at most a very small cash surplus and possibly a deficit even at high employment.

"In the present situation the only acceptable course to follow is to reduce expenditures," the committee says, adding that if this effort fails "Congress must assume responsibility for raising taxes as the least dangerous of the other alternatives."

"To increase taxes would be especially risky now in view of the present business uncertainty," the committee says.

## Object to Royalty Act

SERIOUS objections to the proposed permanent peacetime Royalty Act, sponsored by Justice, National Military Establishment, and Treasury, introduced by Rep. Joseph R. Bryson (Dem., S. C.), and now before a subcommittee of the House Judiciary Committee, are being expressed by industry spokesmen. In effect a patent royalty renegotiation act, it is even more drastic than the wartime Royalty Adjustment Act. If the head of a government contracting agency decides that, in his judgment, a royalty previously agreed upon and embodied in a written contract is too high from the government's standpoint, he can reduce it arbitrarily. The contractor has no recourse excepting to enter suit in the Court of Claims—and such procedure is costly, slow, and often ineffective.

"The proposed legislation should be recognized for what it is—one of a long series of attacks upon the patent system," the subcommittee was told by George E. Folk, adviser to the Patents & Research Committee, National Association of Manufacturers.

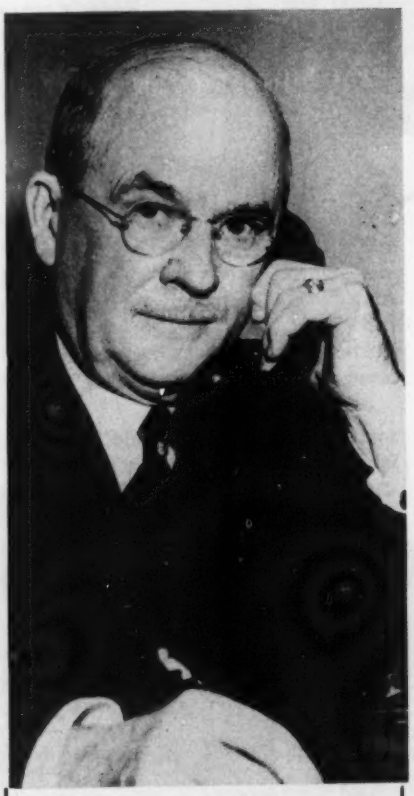
"While such repudiations of contracts by the government would be a hardship to business in general," he said, "it would be particularly unfair to independent inventors and small business enterprises whose income to a large extent is dependent upon royalties from inventions."

## ECA Promotes Small Business

INTENSIFYING its effort to assist small United States firms in getting business under the Marshall Plan, the Economic Cooperation Administration has sent Raymond R. Dickey to Europe to make a survey and submit recommendations on how the ECA can provide "small business" with advance information on proposed ECA-financed purchases. Mr. Dickey, who formerly served as chief counsel for the Senate Small Business Committee, will have headquarters at the ECA offices in Paris. This is the second move by ECA to foster small business; Bert H. White, formerly of the Liberty National Bank, Buffalo, recently was appointed small business consultant at ECA's Washington headquarters (STEEL, May 16, p. 60).

## Support for Trade Fairs

PLANS to hold international trade fairs in the United States in 1950 are receiving active government support—although there is no appropriation out of which any government agency could bear any of the expense of promoting and conducting such fairs. Right now Dr. Jacques Kunstenaar, head of the Fairs & Exhibitions Branch of Commerce's Office of International Trade, is preparing recommendations as to how such fairs may be successfully planned and promoted, and what procedure will encourage maximum attendance from the various foreign countries.



HEADS NAVY: Francis P. Mathews, Omaha banker-lawyer, has been nominated to be secretary of the Navy, succeeding John L. Sullivan. Mr. Mathews is a former president of the Chamber of Commerce of the United States. He has had no previous experience with the Navy, but believes the strength of American armed services results in part from the fact they have been directed by civilians. NEA photo

## Predicts Alaskan Growth

ALASKA is hailed as a new land of opportunity, in a report to President Truman by Secretary of Interior J. A. Krug. In the past two years, he says, the government has put down the foundation for "an economic and military fortress" in the territory. He foresees the day when Alaska will have population "five times the 100,000 the territory now supports." The work will continue to go forward, he says; more than $152 million are available for expenditure in the current fiscal year not including balances from previous appropriations.

Biggest projects under way are great airports at Fairbanks and Anchorage which will make Alaska "the crossroads for air traffic to and from the Eurasian continent"; modernization of the 471-mile Alaska Railroad with heavier rail, modern diesel locomotives, freight and passenger cars, steel bridges, new terminals and shops; construction of new highways in central Alaska, and improvement of seaports. Most encouraging industrial development is preliminary work toward construction of a $30 million pulp mill by Ketchikan Pulp & Timber Co., and start of negotiations for another pulp mill near Sitka.

But what now is being done is only a beginning, says the Krug report. There continues an acute power shortage; only ½ of 1 per cent of Alaska's resources of 50 billion kilowatt hours of hydroelectric energy now is being developed. Land surveys have been completed for only 2/3 of 1 per cent of the 585,000 square miles.

Mineral survey and exploration work has been even less complete. Undeveloped minerals, says the report, include coal, oil, lead, zinc, nickel, tungsten, tin, chromite, iron, mercury and graphite. "These should be explored as soon as possible so that private enterprise can know where to go to locate mines and smeltering and processing plants." The Navy, the report says, has had encouraging results from exploring its Arctic Circle oil reserve. The shortage of transportation is a great handicap, it says; there are only 3000 miles of highway and roads in the entire large region.

# European Labor's Productivity Rises

**Increase of 9 per cent in 1948 is largely responsible for boosting production, except in Western Germany, about 17 per cent over the 1938 level**

LABOR'S productivity in Western Europe rose an estimated 9 per cent in 1948 and was largely responsible for boosting production in the area, excluding Western Germany, about 17 per cent over the 1938 level. This is the major conclusion of the Organization for European Economic Cooperation in its interim report on the recovery program.

Another sharp gain is anticipated for 1949, although by 1950 the normal pattern of a 2 or 3 per cent rise is expected to return. Despite the increase, however, European industrial labor's productivity is still only about one-fourth that in the United States. The main factor limiting the rise in Europe is the low rate of capital investment which last year amounted to about $12 per head in 1938 prices, as against $65 per head in the United States.

Marshall Plan aid may stimulate European capital investment this year, but not to anything like the American level. In 1948 the rate of capital formation in Europe was about 25 per cent higher in real terms than in 1938. Investment in fixed capital in Europe, excluding Germany, which amounted last year to around $5 billion of 1938 purchasing power, was only about half the equivalent figure for the United States. The United Kingdom and France alone accounted for half the $5 billion total.

Since Europe must pick and choose in its expansion programs, a greater increase in electricity output is planned than in many other industrial categories. By 1953 the electricity production index is expected to stand at 222 (1935-1938=100). French hydroelectric programs are the most ambitious in Western Europe, but the most spectacular scheme, still only in the speculative stage, would put the Mediterranean to work. This plan, which received much publicity on the continent during the Hitler era, but was unmentioned outside, calls for dams at Gibralter and the Dardanelles that would have power plants capable of producing 167 million hp; reclamation of 330,000 sq miles of land from part of the present sea bed; and land irrigation.

## Great Britain

ANGLO-American Council on Productivity's second session, held in New York recently, has given impetus to Britain's campaign to boost its productivity through knowledge of American "know-how." By the time this year is over more than 30 British productivity teams will have toured the United States.

Productivity is also at the core of one of the Conservative Party's main criticisms of the steel nationalization bill now up for consideration in the House of Lords. Nowhere in the bill is there any indication of schemes to insure higher production or greater efficiency in the industry. The measure is also hazy as to who or what will determine if or the extent to which the industry will be expanded.

Steel ingot and casting production for April was at an annual rate of 17,756,000 net tons, compared with a rate of 18,221,000 in March and a rate of 17,117,000 in April, 1948. Pig iron output last month was at a rate of 10,402,000 tons, compared with a rate of 10,410,000 in March and a rate of 10,565,000 in April, 1948. Second quarter steel allocations have been relaxed.

Some industries, however, still complain they are getting far too little steel. Shipbuilders are particularly vehement, pointing out that their labor force is losing morale and productivity as a result. During the first quarter of this year, 2,075,000 tons of shipping were under construction in British yards, 62,000 tons less than in the first quarter of 1948 and 168,000 tons below the peak in June of that year. Shipbuilders claim they could easily match or surpass last year's records if they had more steel. Activity in foreign shipyards has continued to rise, and the proportion of world tonnage under construction in Britain has fallen to 47.7 per cent. During the past quarter, the tonnage of shipbuilding in Britain on foreign account fell for the first time in three years.

Productivity in government has also come up for examination recently. Britain has 684,748 civil servants now, against 374,748 Apr. 1, 1939. not including the workers in arsenals and nationalized enterprises. The opposition in Commons is likewise attacking the system of subsidies in Britain. In 1932 nearly 0.8 per cent of the national income in the U. K. came from government subsidies. In that year 3.6 per cent of the government's income went into subsidies. In 1948 more than 4.4 per cent of the national income came from subsidies, and over 12 per cent of the government's income went into subsidies.

## France

UNPRODUCTIVITY of subsidies is even more marked in France. In 1932 about 1.6 per cent of the national income came from subsidies financed by 10 per cent of the government's revenue. In 1948 about 2.5 per cent of the national income was derived from subsidies financed by 14 per cent of the government's income.

French Price Control Commission is restudying the price structure in the steel industry with the primary aim of establishing a more realistic relation among the selling price, labor cost and other production costs. French economists hope that a fairer relation would boost worker productivity.

The labor front in France remains as calm as at any time since the war. General industrial production is now about 20 per cent above the immediate prewar level as a result. The nationalized Renault automobile works says that higher productivity is the major reason for its recent price decrease on the 4-hp model. Renault now produces 6000 cars per month, half of which are this unit. By the end of the year a level of 8000 vehicles per month is anticipated. For the industry as a whole, output for the year may reach 200,000, compared with 100,000 in 1948.

## Western Germany

NEBULOUS situation regarding ownership of the Ruhr steel and coal industries limits productivity in Western Germany. Trade unions, officials and private interests are now waging a furious war of reports and counter-reports on the future setup of the industries. A special committee chosen by the German Economic Council says the confusion must be cleared up for no one now cares to invest any money in even necessary repair work. Western German production is still only 65 to 70 per cent of the 1938 level.

Fears that unemployment may reach 2 million are prevalent. Lack of capital expansion is the main reason for work scarcity. Welcome capital in the form of U. S. payments for German scrap will soon vanish once the current contracts are completed. The German price of $28 per ton is far above the present American quotations.

# Expands Electric Furnace Capacity

**Rotary's fifth unit boosts steelmaking capacity to 420,000 ingot tons annually. Facilities designed to serve automotive and allied consumers**

ROTARY Electric Steel Co., Detroit, is putting finishing touches on a program of expansion and improvement involving expenditure of over $5 million since 1944. Five years ago, the company operated two electric furnaces, a 50-ton and a 30-ton unit, with rolling facilities for bars and billets limited in capacity to the output of the two furnaces—160,000 tons annually. March saw a fifth 60-ton electric melting unit brought into operation, boosting annual melting capacity to 420,000 ingot tons. Two of the three-electrode arc furnaces are top-charge types, the other machine charged.

To handle the added melting capacity, until recently programmed largely for production of sheet bar and for ingots to be rolled by other mills, an old bar mill is being rebuilt completely, providing a greater range of sizes as well as increased tonnage. A 30-inch mill has been added, presently used for rolling of sheet bar, and in the future destined to become an integral part of the expanded bar mill.

**New Bloomer Installed**—A 28-inch blooming mill also has been rebuilt, increasing its capacity substantially. However, by midyear, this unit will become only a part of the overall blooming operation, as a new 36-inch bloomer is being installed to furnish capacity for 60,000 tons monthly. The smaller blooming mill will handle only up to 18-inch ingots, while the new equipment will accommodate up to a 25-inch size.

These basic changes have necessitated a number of others, such as an 80-foot extension to the melt shop; a new, light building for conditioning ingot molds; installation of six oil-fired soaking pits which will obsolete the present batch-type ingot heating furnaces; plus a complement of additional cranes, diesel switching locomotives and considerably expanded trackage to handle both incoming and outgoing materials.

**To Serve Automotive Users**—Rotary plans to concentrate its efforts on automotive users and allied steel consumers in the Michigan and neighboring areas, principally because of its strategic location from the standpoint of raw material—mainly steel scrap—and the nearness of many large customers. Earlier attempts at national sales coverage have been abandoned for the time being.

Unusual strides have been made in electric melting techniques. Enjoying favorable power rates and ample quantities of high-grade electric furnace scrap, it has been possible to turn out heats as large as 70 tons of low-carbon deep-drawing steel, in less than six hours with the top-charge furnaces. Overhead cranes swing large drop-end boxes loaded with up to 25,000 pounds of scrap over the opened furnaces and deposit the charge in a matter of seconds. The boxes are loaded by magnet crane from stocks in an adjacent covered scrap storage building, and then are switched into position on the charging floor for quick pickup. The charging floor is on a level about 20 feet above the ground, with scrap storage on one side and ingot pouring floor on the opposite side. Area below the furnaces is used partially for building replacement roofs which weigh about 13 tons and are hoisted by crane up through removable floor sections in the charging balcony. Under normal conditions, furnaces will operate for about two weeks or 55-60 heats before new roofs are needed.

Rotary Electric was organized originally in 1933 as the Rotary Electric Steel Co. (Michigan), planning to pour ingots into spinning molds of a circular or ring-type, then cut them apart and roll the resulting ingot or bloom down to bars and billets, obviating the need for the conventional blooming mill operation. After some experiment the process was abandoned and a small blooming mill installed. Reincorporation in 1944 involved assumption of all the assets and business of the parent company. During the war large tonnages of aircraft quality alloy and bearing steels were produced.

*General view of Rotary Electric's expanded melt shop, showing four of the five 50-ton electric furnaces now operated to give annual capacity of 420,000 ingot tons*

# Rail Steel Bar Men Meet

**Discuss scrap prices, product standards, competitive situation at Chicago convention**

ON May 12-13, thirty-five representatives of the 13 rolling mills comprising the Rail Steel Bar Association held their annual meeting at the Edgewater Beach Hotel in Chicago.

The industry is happier over the fact that its raw material, scrap rails, has dropped from a high of around $80 to $85 per ton to $27 and may go lower. The supply of rails also is adequate. In fact, the president of one company said, "I was even able to reject several cars not meeting specifications a few days ago."

Reinforcing bars account for about 35 per cent of the products rolled by the industry, the balance including plain hot-rolled bars, agricultural sections, fence and sign posts, track spikes, etc. Association committees now are studying standards for its products. For instance, no two states have the same standards for roadside sign posts.

**Headed By Irwin**—President of the group is O. W. (Bill) Irwin, formerly manager of reinforcing bar sales for

Carnegie-Illinois. Only a few rerollers, mostly major steel companies, are not members of the association.

Included on the convention program was a review of the performances of the industry in 1948, and a discussion of steps to be taken to meet the highly competitive situation immediately before the industry.

Considerable time was spent in a review of research activities. Last year the industry consumed in excess of three-quarters of a million tons of used rails. Its largest tonnage item was concrete reinforcing bars which accounted for approximately 35 per cent of the industry's total output. In former years this ran as high as 75 per cent.

**Presents Summary**—C. A. Willson, research engineer, American Iron & Steel Institute, presented an historic summary and review of achievements of his Research Committee on Reinforced Concrete. The principal result of the seven-year study to date is improvement in the deformations on concrete reinforcing bars. The members of the rail steel bar industry are in almost 100 per cent production in bars which meet the new specification promulgated by the American Society for Testing Materials, bearing number A305. On such bars the Bond Committee of the American Concrete Institute recently recommended a considerable increase in the working bond stress, thereby making it possible for consulting engineers and architects to largely eliminate expensive hooks on concrete bars.

The association has a very active works managers group which is in the midst of two important studies. One relates to furnace practice in the heating of used rails before rolling. Accurate studies are being made in the efficiency and cost of the three varieties of fuels used by the various members, powdered coal, oil, and gas. Tentative conclusions were presented by this group which not only will result in a better finished product, but also in reduction in the cost of manufacture.

**Job Evaluation**—The other project is a job description and job evaluation study. A progress report was presented which indicated improved industrial relations could be experienced from applying the information and classifications under study.

The industry is trying to improve its public relations through the showing of a 35 minute, 16 mm film.

The Technical Committee reported considerable progress in its efforts to acquaint specifying authorities with the advantages of using high strength rail steel.

# Four Technical Sessions

## Scheduled for 57th general meeting of American Iron & Steel Institute May 25-26

FOUR programs covering timely operating and metallurgical problems in the iron and steel industry will feature the 57th general meeting of the American Iron & Steel Institute to be held at the Waldorf-Astoria, New York, May 25-26.

Subjects covered by the 11 technical papers are: 1. Increasing production in the open hearth; 2. control of sulphur in steelmaking; 3. reseach in steel melting; 4. general research. Chairmen of the technical sessions will be H. W. Johnson, vice president, Inland Steel Co.; C. E. Davis, vice president, Alan Wood Steel Co.; R. S. Poister, vice president, Crucible Steel Co. of America; A. V. Wiebel, vice president, Tennessee Coal, Iron & Railroad Co.

The two-day meeting will open with the Charles M. Schwab memorial lecture to be delivered by Dr. Karl T. Compton, chairman, Research & Development Board, National Military Establishment, and chairman of the corporation of the Massachusetts Institute of Technology.

Speakers at the general session to be held on the second day of the meeting will be: Walter S. Tower, president of the institute; Hugh Morrow, chairman, Sloss-Sheffield Steel & Iron Co.; Clarence B. Randall, president, Inland Steel Co.

At the industrial relations session to be held the afternoon of May 26, Sumner H. Slichter, Lamont University professor at Harvard University will speak on "The Changing American Economy."

TOUGH FINISH: Electricweld steel tubing coated with a plastic rust-resisting finish can be fabricated by bending, expanding, flanging, upsetting, fluting and flattening without damage to finish according to Jones & Laughlin Steel Corp., producer of the new product called "perma tube." Shown here is a test specimen deformed by compression, with coating unaffected

# CALENDAR
## OF MEETINGS

**May 23-24, American Steel Warehouse Association:** 40th annual meeting, Ritz-Carlton, Atlantic City, N. J. Association headquarters are at 442 Terminal Tower, Cleveland.

**May 25-26, American Iron & Steel Institute:** 57th general meeting, Waldorf-Astoria, New York. Institute headquarters are at 350 Fifth Ave., New York.

**May 27, Malleable Founders' Society:** Western sectional meeting, Palmer House, Chicago, Society headquarters are at 1800 Union Commerce Bldg., Cleveland.

**May 29-31, Conveyor Equipment Manufacturers Association:** Spring meeting, The Homestead, Hot Springs, Va. Association headquarters are at 1129 Vermont Ave. N. W., Washington.

**May 30-June 1, Metal Treating Institute:** Spring meting, Chateau Frontenac, Quebec, Canada. Institute headquarters are at 420 Lexington Ave., New York.

**May 30-June 10, Canadian International Trade Fair:** Toronto, Ont., sponsored by the Canadian government.

**June 1, Water & Sewage Works Manufacturers Association Inc.:** Annual meeting, Stevens Hotel, Chicago. Association headquarters are at 170 Broadway, New York.

**June 1-3, Material Handling Institute:** Meeting, Asheville, N. C. Institute headquarters are at 1108 Clark Bldg., Pittsburgh.

**June 2-4, Electric Metal Makers Guild:** 17th annual meeting, Bismark Hotel, Chicago. Guild secretary-treasurer is D. L. Clark, 39 Grasmere Rd., Lockport, N. Y.

**June 5-10, Society of Automotive Engineers:** Summer meting, French Lick Springs Hotel, French Lick, Ind. Society headquarters are at 20 W. 39th St., New York.

**June 6-8, American Gear Manufacturers Association:** 33rd annual meeting, The Homestead, Hot Springs, Va. Association headquarters are in the Empire Bldg., Pittsburgh.

**June 9-10, Steel Founders' Society of America:** Industrial relations meeting, Drake Hotel, Chicago. Society headquarters are in the Midland Bldg., Cleveland.

**June 13-14, Stoker Manufacturers' Association:** Annual meeting, French Lick Springs, Ind. Asociation headquarters are at 307 N. Michigan Ave., Chicago.

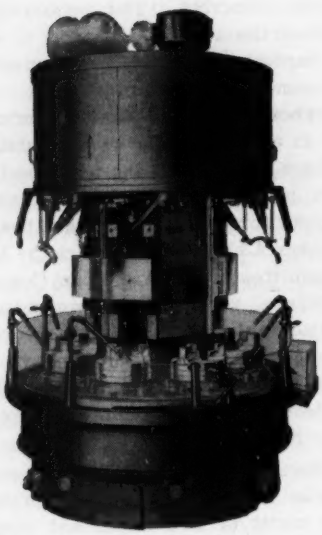
**June 13-15, Material Handling Institute:** Great Lakes materials handling conference, Doermann Theater, University of Toledo, Toledo, O. Institute headquarters are at 1108 Clark Bldg., Pittsburgh.

**June 13-15, American Society of Mechanical Engineers:** 15th national applied mechanics conference, Ann Arbor, Mich. Society headquarters are at 29 W. 39th St., New York.

**June 16-17, Malleable Founders' Society:** Annual meeting, The Homestead, Hot Springs, Va. Society headquarters are at 1800 Union Commerce Bldg., Cleveland.

for your information

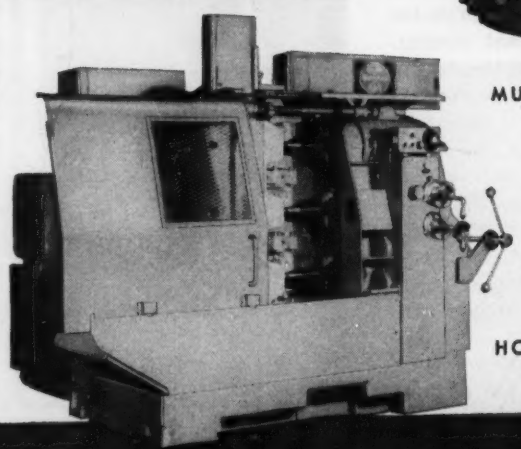
the BULLARD complete line



TYPE "D" MULT-AU-MATIC

BULLARD

36 INCH CUT MASTER



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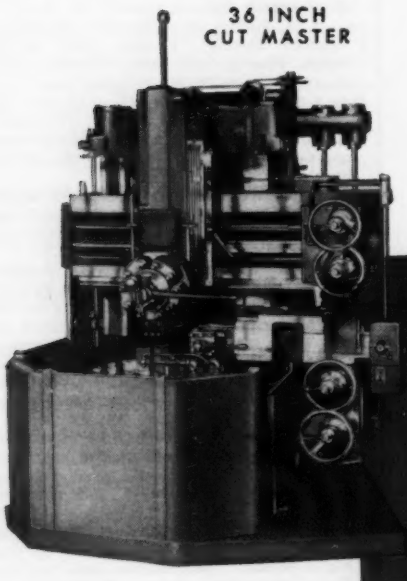

BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

By A. H. ALLEN *Detroit Editor, STEEL*

# Mirrors of Motordom

**United Auto Workers becoming embarrassed as Ford strike drags on, cutting output by at least 25,000 and imperiling chances of union to win any of 1949 economic demands**

*DETROIT*

AS THE Ford strike dragged on to its second week—the longest stoppage the company had ever experienced, including the UAW's major organizing drive back in 1941—the union's international officers were frantically searching for some publicity gimmick which would end the trouble and at the same time save their red faces. They hotly denied management charges the difficulty developed through internal politics in the union, and called on Cyrus S. Ching, federal mediation director, to step into the negotiations, confident he would be a good sounding board to get their case across to the public. Mr. Ching preferred to keep his department's participation at the Detroit level and asked his regional representative to "contact" company and union representatives.

Ford suggested the federal mediator weigh all angles of the dispute before moving in, adding that one of the significant issues presented was the question of "whether the integrity of contracts mutually agreed to by American labor and management is to be preserved, or whether such a contract and all its careful safeguards of industrial peace can be thrown into the ashcan whenever a high political wind blows upon the union.'

Obviously, the UAW has made determined efforts to refute the political angle, yet it remains a fact the strike was called by Ford Local 600, whereas the union constitution stipulates this right is reserved for the international executive board or president.

**Ambitious** — Another angle concerns the political ambitions of Thomas Thompson, president of the Ford local, who is said to have his eye on a vice president's job in the international organization. Months ago, when radical elements in the union first began their haranguing on the "speed-up" issue, he upbraided their action, but when he saw the group carried more weight than he had thought he changed his mind and supported the protest in order to reinforce his prestige as head of the local.

The union's request that negotiations be opened on a new contract simultaneously with attempts to settle the strike drew a reply from the company to the effect it would like to open such negotiations but could not do so in the atmosphere of a major strike. A date of June 1 was proposed, providing operations have been resumed by then, and the company indicated its intention to reopen all economic matters covered in the agreement, because of their relation to production costs. John S. Bugas, industrial relations vice president, was quoted as saying there was little chance of the company agreeing to wage increases in any form, either in hourly rates or in the form of pensions, social security, etc. He also urged the UAW to reduce its negotiation committee from the usual 14 to 18 to no more than six men, the same number the company has on its committee.

**Automobile Production**

**Passenger Cars and Trucks—U. S. and Canada**

| | 1949 | 1948 |
|---|---|---|
| January | 445,092 | 422,236 |
| February | 443,734 | 399,471 |
| March | 543,711 | 519,154 |
| April | 563,300* | 462,323 |
| May | ..... | 359,996 |
| June | ..... | 454,401 |
| July | ..... | 489,736 |
| August | ..... | 478,186 |
| September | ..... | 437,181 |
| October | ..... | 516,814 |
| November | ..... | 495,488 |
| December | ..... | 514,337 |
| 12 mos. | ..... | 5,549,323 |

* Preliminary.

**Estimate for week ended:**

| | 1949 | (Same week) 1948 |
|---|---|---|
| April 30 | 136,433 | 102,967 |
| May 7 | 130,113 | 84,684 |
| May 14 | 116,563 | 83,275 |
| May 21 | 108,000 | 91,138 |

*Estimated by Ward's Automotive Reports*

**Say Lines Overstaffed**—Settlement of current arguments over work standards on Ford final assembly lines at the Rouge and Lincoln plants here, admittedly the sole issue to be resolved, hinged over the company's right to insist on a predetermined number of assemblies each day. Interruptions to an even flow of the lines, almost unavoidable because of breakdowns, delays in movement of material and parts to assembly stations and other contingencies, make it necessary to do one of two things—run the line a little faster after shutdowns with the same personnel, or add additional workmen when the line is speeded up. The union stood firm on refusal to permit lines to be operated above standard speed, although the extra effort involved in such infrequent accelerations is only 5 to 10 per cent. The company maintains the lines have been overstaffed right along, and the difficulties of moving in extra crews whenever the line moves a little faster are understandable.

Mr. Bugas tossed the union a hot one Tuesday with the unorthodox yet entirely logical proposal that since the speed-up complaint centered around only 5000 men on two assembly lines, why not revise the strike authorization to keep these two lines down and permit the rest of the Rouge plant and Ford assembly system to resume normal operations. After trying to figure out an answer, the best the UAW could do was to reject the idea as "fantastic" and another example of the "old employer trick of divide and rule." In other words, the union acknowledges 100,000 employees, plus thousands of men in suppliers' plants, plus thousands of dealers and their employees must go into enforced idleness, with serious economic loss, to lend moral support to the dubious complaints of 5000 assembly line workers.

**Cutbacks Pile Up**—If the hot-heads behind the Ford strike could take a closer look at industrial operations in many sections of the country outside of Detroit, where layoffs and cutbacks in working hours have been piling up regularly, they might forget about complaints over being required to put in a few ounces of extra effort now and then to keep the jobs rolling. You need to journey only a couple hundred miles from Detroit to find business sentiment steeped in gloom. In Muskegon, Mich., for example, reports indicate conditions are nearly as bad as they were back in 1932 and prospects for the summer forecast little improve-

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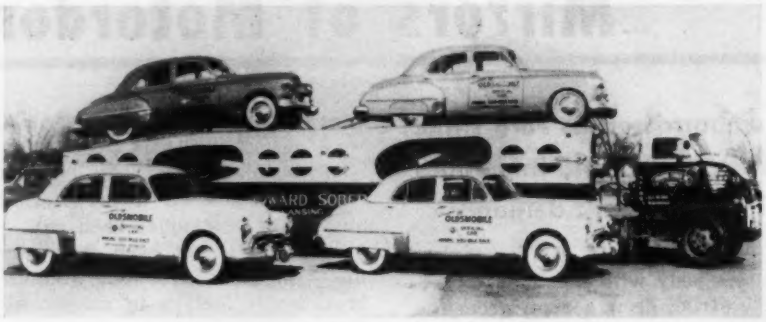


PACESETTERS: Enroute to the Indianapolis race track are these "88" Oldsmobiles, designated as pacesetters and official vehicles for use by race staff members. Wilbur Shaw, general manager of the Speedway Corp., will drive the official pace car, a convertible

ment. The automotive replacement parts business has sagged badly, forcing numerous manufacturers in this field to retrench. In New England, several large companies in the metalworking field have trimmed operations to 32 hours a week and laid off hundreds. Booming automobile production has given residents of the Detroit area a false impression of the picture country-wide.

Further testimony to internal dissension in the UAW came to light Tuesday with the news of letters sent to 900 locals throughout the country by Thompson of the Ford unit, telling them settlement of the speed-up dispute would set an industry-wide pattern to adjust similar complaints. This conflicted with statements from Walter Reuther, UAW president, who said the Ford assembly line practices differed from those of other companies and, therefore, should be brought into line. International union officers, confronted with this divergence of opinion, were inclined to ignore the Thompson letter.

**Slashes Car Output** — The Ford stoppage has slashed industry production of cars and trucks by at least 25,000 units with the last of the Ford assembly plants closing a few days ago. Chrysler divisions were able to resume last week after a truce was worked out in the plant of a supplier furnishing ventilator windows and moldings. Packard also picked up Wednesday after being closed for two weeks from lack of brakes. Dies were removed from strikebound Bendix Aviation plants in South Bend, Ind., and set up at Detroit, permitting a partial resumption of the flow of brakes to assembly lines.

## GM Sets Production Pace

GENERAL Motors Divisions continue the hottest pace setters the industry has seen in a long while, all units except truck manufacturing operating 9-hour shifts and some Saturday work. Weekly production of GM plants is close to 60,000, pushing corporation output to better than 50 per cent of the entire industry for the first time in history. April percentage was 44.6. The steady climb of GM is raising in some minds the question of "bigness" and how it may react on some of the economic freethinkers in Washington.

Is it conceivable, for instance, that GM might push its share up to 60 per cent, — 75 per cent — and what might this mean in terms of pressure from the government? Would that constitute a monopoly? A trust that has to be "busted"? There is little question these matters are being given some thought by the GM hierarchy, although their forthright declarations are to the effect they are out to sell all the cars they can in the belief that public acceptance of price-value relationships constitutes no crime.

One observer of the situation has suggested facetiously the corporation might consider appropriating a few millions from its treasury to distribute among competitors in the interests of maintaining healthy competitive conditions. At any rate, GM is holding the throttle open on production, and purchasing schedules through September indicate a sustained tempo of better than 12,000 units daily.

## Chrysler Output Up

CHRYSLER sold 242,104 cars and trucks in the first quarter, compared with 228,256 in the same period a year ago. Profit yield was 4.7 per cent on $18.7 million sales, or the equivalent of $77 per unit, giving effect to income of nearly $5 million in dividends from foreign subsidiaries.

Arguments pro and con continue on conservative styling of Chrysler's models. Around Detroit — perhaps not at all representative of the country at large—there is a considerable segment of opinion which feels that Chrysler actually retrogressed stylewise, although admittedly many worthwhile engineering advances were introduced. This group wonders whether passenger cars can be sold on engineering," in view of the fact women exert such a major influence on sales. From all indications so far, national response to Chrysler models has been excellent and every effort is being made to extend production to the limit. Labor flareups and suppliers' strikes have prevented this attainment. In any event, close attention will be paid to the Chrysler sales record over the next few months, either to justify or refute the arguments now bouncing across luncheon tables here.

## Keller To Offer Stock

REGISTRATION statement has been filed with the SEC by Keller Motors Corp., Huntsville, Ala., covering the public offering of 5 million shares of common stock, at $1 per share, with Greenfield, Lax & Co., New York, named as underwriter. Keller has been in process of developing a new passenger car for several years and declares its intention to build a design which will sell in the lowest possible price class while at the same time retaining the maximum possible conventional features of present cars.

First product, of which several working models have been handbuilt, will be a 5-passenger station wagon priced at $1195, f.o.b. factory in a standard type, and $1245 for a Deluxe version. Eventually, it is planned to build other sedan models priced as low as $895.

George D. Keller, chairman of the board, has been the motivating force behind the project. H. Christa Smith is president and Hubert R. Mitchell, executive vice president, treasurer and director, the latter transferring property he owned at Hartselle, Ala., to the company in 1947. For it he received 150,000 shares of Class A stock and he will be reimbursed $150,000 out of proceeds of the new issue. Plant facilities and equipment will require $505,500, engineering and tool design $250,000, and tools, dies, jigs and fixtures $1.5 million, leaving working capital of $1,756,000.

The car is to be powered by a 4-cylinder Hercules engine, is 172 inches long on 92-inch wheelbase, weighing 2200 pounds. Springs are the rubber torsion type, while 70 per cent of all parts are said to be standard, purchasable on the open market.

# Question: Who's price-conscious now?

# Answer: We are!

THE other day we had a very special sales meeting. (We bend and weld steel rings and flanges for industry, you know.) Nels Berggren, Herb Jones and Jack Gibbons agreed that every plant they call on is buying price. That's the inescapable truth, they told us, and the devil take the hindmost.

So, gentlemen, having a disaffection for the old boy and a wholesome desire to continue to eat regularly, we are revising our prices drastically downward; giving our salesmen and the purchasing agents who buy our products a real break. If you can use bent and welded steel rings in your business, send for a capacity chart and other information today.

*Will you send the coupon now?*

KING
FIFTH WHEEL
COMPANY
2919 N. Second St.
Philadelphia 33, Pa.

KING FIFTH WHEEL CO.
2919 N. Second St.
Philadelphia 33, Pa.

Please send me, without obligation, information about your product and service.

*Company name*.....

*My name*.....

*Address*.....

*City*..... *Zone*..... *State*.....

## New Cleveland Warehouse

**For U. S. Steel Supply Co. covers 167,000 sq ft of area, replaces facility destroyed by fire**

UNITED States Steel Supply Co. played host May 14 to more than 2800 customers in its new warehouse at 7105 Bessemer Ave., Cleveland. L. B. Worthington, president of the U. S. Steel subsidiary, and E. J. Heffner, Cleveland district manager, were hosts for the function.

The new plant, covering 167,000 sq ft of area, was near completion last summer when fire destroyed the former warehouse. Operations then were started in the new facility which has been serving the company's customers ever since. New equipment installed includes an hydraulically controlled, high speed, friction saw and a 52-ft overhead transfer crane with a capacity of 10 tons.

All traffic in the warehouse is directed so that it moves in one direction. Incoming steel is received at the east end of the building and is stored, processed and handled in the four main aisles each about 440 feet long. Orders for shipment are moved to the transfer aisle for loading on trucks that move out the west end of the building.

## Consolidated Western Shifts

OPERATIONS of Consolidated Steel Corp. of Texas and Consolidated Western Constructors Inc., have been taken over as divisions of their parent company, Consolidated Western Steel Corp.

This was effective April 30, according to the announcement of Alden G. Roach, president of Consolidated Western, a subsidiary of U. S. Steel.

Following officials of the two divisions have been appointed to new positions in Consolidated Western: Harvey C. Cranfill, vice president—administration, for the Texas Division, Orange, Tex.; Charles W. Lee, vice president—production, for the Texas Division, Houston, Tex.; F. J. Lackey, vice president—sales, for the Texas Division, Houston; W. E. Goodere, sales manager—construction, for the Texas Division, Orange; J. H. Long, sales manager—fabricated products, for the Texas Division, Houston.

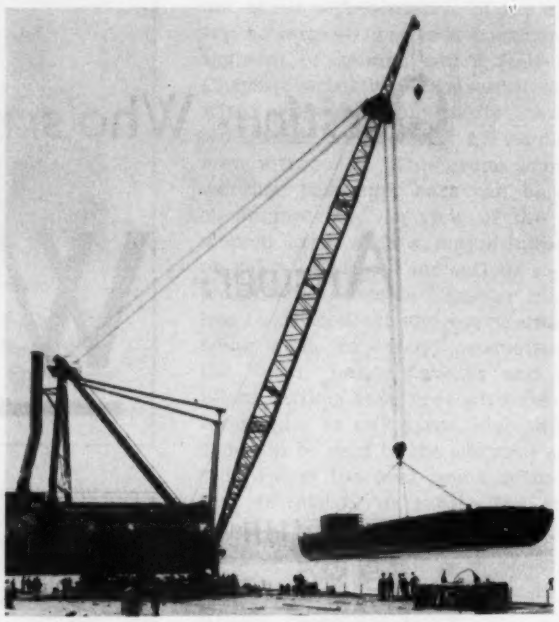
## L.A. Fifth Largest Industry Area

RAPID growth of Southern California as a market for metals and metalworking equipment is revealed in the advance of Los Angeles County from ninth place prewar to fifth place currently among the nation's industrial areas.

According to a survey by the Research Department of the Security-First National Bank, Los Angeles, this city since 1939 has moved ahead of Cleveland, Pittsburgh, and Boston, in total manufacturing wages and salaries. Although numerically behind New York, Chicago, Detroit, and Philadelphia, Los Angeles showed the largest percentage gain for manufacturing wages in the nation's 33 major industrial areas. Its expansion of 113 per cent between 1939 and 1948 compares with the national average of 55 per cent.

Since 1939 Los Angeles has moved from ninth to fifth in manufacturing wages, from ninth to sixth in manufacturing employment, and from ninth to fifth in value added by manufacture.

SEEKS OIL IN GULF: Exploring for untapped petroleum deposits in the Gulf of Mexico is the work of this floating crane, built by Barium Steel Corp.'s subsidiary, Wiley Mfg. Co., Port Deposit, Md. A self-sustained unit capable of operating offshore for indefinite periods, the unit includes a 150-ton crane mounted on a 300-foot barge



## Geneva's Tax Valuation Raised

GENEVA Steel Co. plants at Geneva and Ironton, Utah, are assessed at $25,990,314 on the 1949 property tax roles in Utah county, an increase of $3,861,232 over 1948 valuation.

The Geneva plant alone is valued at $24,093,429 for tax purposes, an increase of $3,851,665 over last year, while the Ironton properties show a boost of $9567 to $1,896,885. Last year the two plants were valued at $22,129,082.

Increases are due largely to construction of the new hot strip mill at Geneva.

Since assessments were made as of Jan. 1, when the mill was still several months from completion, the valuation likely will climb even higher next year.

Carrying the largest assessment of any single industry in the state, Geneva last year paid a tax bill of $762,509.67 to Utah county, approximately one-fourth of county tax collections. Included was $698,340.86 for the Geneva plant and $64,168.81 for Ironton.

## Zinc Residue To Be Salvaged

MILLIONS of dollars worth of zinc, in a pile of metal-bearing plant residue at Flin Flon, a mining town in northern Manitoba, Canada, will be salvaged with the help of specially designed Babcock & Wilcox Co. equipment which is now being built. The apparatus will be used by Hudson Bay Mining & Smelting Co. Ltd. in connection with the fuming process for treating reverberatory slag which contains zinc from copper concentrates and zinc plant residue.

The copper-zinc ore, with gold, silver and smaller amounts of cadmium, selenium and tellurium, is being mined at the Flin Flon mine. The zinc residue from the zinc leaching plant has been continuously stockpiled by the company since 1930 and is now estimated to total nearly 800,000 tons.

Included in the Babcock & Wilcox equipment to be used in the recovery operation are two waste heat boilers, coal handling and pulverizing equipment, vertical economizers, superheaters, automatic soot blowers, meters and controls.

# Briefs . . . .

## Paragraph mentions of developments of interest and significance within the metalworking industry

**Nelson Stud Welding Division,** Morton Gregory Corp., Lorain, O., has awarded a franchise to Nelson Construction Service Co., Cleveland, to sell end-welded roofing and siding fasteners in northern Ohio.

—o—

**Proctor Electric Co.** suspended operations for a short time beginning last Monday at its Philadelphia plant. The Baltimore facility is not affected. Difficulties in getting into production on a new model iron and a model changeover of the toaster line were given as reasons for the halt.

—o—

**Noma Electric Corp.,** New York, reports that all fixed assets, machinery and inventories of its subsidiary, Central Railway Signal Co., Inc., Peru, Ind., have been sold for $603,264. Liquidation of the subsidiary is contemplated within the near future.

—o—

**Esterline-Angus Co.,** Indianapolis, maker of recording instruments and associated products, has named Eicher & Co., Seattle, as its sales and engineering representative for the Seattle territory.

—o—

**Marley Co. Inc.,** Kansas City, Kans., manufacturer of water cooling towers, nozzles and dry surface coolers, has started production in a new plant at Louisville, Ky. C. W. Zimmerman is plant manager. Marley has two other plants in Kansas City and Stockton, Calif.

—o—

**McKay Co.** is moving its electrode sales department to the company executive offices in the McKay Bldg., Pittsburgh. Fred A. Kaufman, electrode sales manager, and his entire staff, formerly at York, Pa., now make their headquarters in Pittsburgh.

—o—

**Doehler-Jarvis Corp.,** New York, has given a $10,000 die casting machine to the metallurgical engineering department at Illinois Institute of Technology. A similar unit was earlier donated to Massachusetts Institute of Technology. Three more will go to other schools soon.

—o—

**Whitman & Barnes,** maker of twist drills, reamers, punches and special tools, a division of United Drill & Tool Corp., has moved from Detroit to 40600 Plymouth Rd., Plymouth, Mich.

—o—

**H. B. Davis Co.,** Baltimore, paint manufacturer, is producing webbable and strippable coatings of the type used by the services for packaging stand-by equipment for outdoor storage under an exclusive license granted by the holders of patent 2,459,164.

—o—

**Continental Copper & Steel Industries Inc.,** New York, announces its division in Perth Amboy, N. J., Welin Davit & Boat, is entering the pleasure craft field for the first time. Two aluminum models, one inboard and one outboard type, are now in production.

—o—

**T. L. Smith Co.,** Milwaukee, manufacturer of concrete mixers and road building machinery, has formed a sales, operating and financial alliance with Essick Mfg. Co., Los Angeles, maker of construction equipment and air coolers. Although the firms will not be consolidated, sales outlets in many areas will handle both companies' equipment. Bryant Essick, president of the West Coast firm, has acquired a substantial block of Smith common stock.

—o—

**Pittsburgh Lectrodryer Corp.,** Pittsburgh, maker of dehumidification equipment, has named Kerr Machinery Co., Detroit, and G. Baillie Houliston, Cincinnati, as agents in the Detroit and southern Ohio areas respectively.

—o—

**Walsh Refractories Corp.** will move to a new general office at 101 Ferry St., St. Louis, on or about June 1.

—o—

**Atlas Imperial Diesel Engine Co.,** Oakland, Calif., has acquired Lorimer Diesel Engine Co., Oakland, and will take over manufacture and distribution of the Lorimer engines. Atlas now offers a line of heavy duty units ranging from 15 to 1000 hp.

—o—

**Hyster Co.,** Portland, Oreg., maker of materials handling equipment, has established a sales and service center at 753 Ninth Ave., Seattle. V. G. Lindenberg is in charge.

—o—

**E. I. du Pont de Nemours & Co.,** Wilmington, Del., has discontinued manufacture of sodium hydride and has licensed Metal Hydrides Inc., Beverly, Mass., to manufacture it under Du Pont patents.

—o—

**United States Rubber Co.,** New York, has completed installation of equipment needed to produce its share of synthetic cold rubber at the plant it operates for the government in Borger, Tex. The plant is stepping up output of the synthetic to a rate of 5.6 million pounds a month.

—o—

**Great Lakes Carbon Corp.,** Niagara Falls, N. Y., will increase its electrode production this summer when it begins commercial operations at its Morgantown, N. C., works. For nearly two years this plant has been used for the Atomic Energy Commission.

—o—

**H. K. Metal Craft Mfg. Co.,** New York, has completed a working arrangement with Johns-Manville Sales Corp. for the fabrication of Johns-Manville Flexboard, a composition building material.

—o—

**Ellinwood Industries,** Los Angeles, has re-entered the aircraft hydraulics, electronics, component parts and accessories business.

—o—

**Magneswitch Inc.,** Chicago, maker of liquid level controls, filters and textile industry apparatus, has changed its name to Jo-Bell Products Inc.

—o—

**Foundry Division, Hansell-Elcock Co.,** Chicago, which recently suffered extensive fire damage to its pattern storage and core rooms, has constructed temporary quarters for these departments and is offering normal service on new gray iron castings orders.

—o—

**Stanworth Mfg. Co.,** Lebanon, Ind., maker of high speed cutting tools, has been sold to Fred G. Phillips, Walter Susemichel and J. Edward Marston, all from Indianapolis. The first two are associated with Engineering Metal Products Corp. No change in personnel is intended.

—o—

**Hyster Co.,** Portland, Oreg., maker of industrial trucks and other materials handling equipment, officially opened its Los Angeles area sales and service facilities at 5301 Pacific Blvd., Huntington Park, Calif., on May 20 with an open house.

—o—

**C. O. Bartlett & Snow Co.,** Cleveland, designer and builder of foundry industry equipment, has appointed R. K. Price Associates Inc., New York, as exclusive export sales representative.

—o—

**Continental Can Co.,** New York, reports additions and alterations to its Paterson, N. J., plant have been completed by Wigton-Abbott Corp. The structure was purchased from Wright Aeronautical Co. last year.

# The Business Trend

LABOR unrest is pulling the tide of business activity downward, causing STEEL's industrial production index to recede to 168 per cent (preliminary) of the 1936-1939 average, lowest mark in the last seven weeks. This level, however, is still 9 points higher than in the corresponding week last year.

**AUTOMOBILES** — Major current in metalworking waters, the automotive industry, ran less swiftly as in the week ended May 14 the Ford strike and several suppliers' walkouts cut total passenger car and truck assemblies to 116,563 from 130,113 in the preceding week.

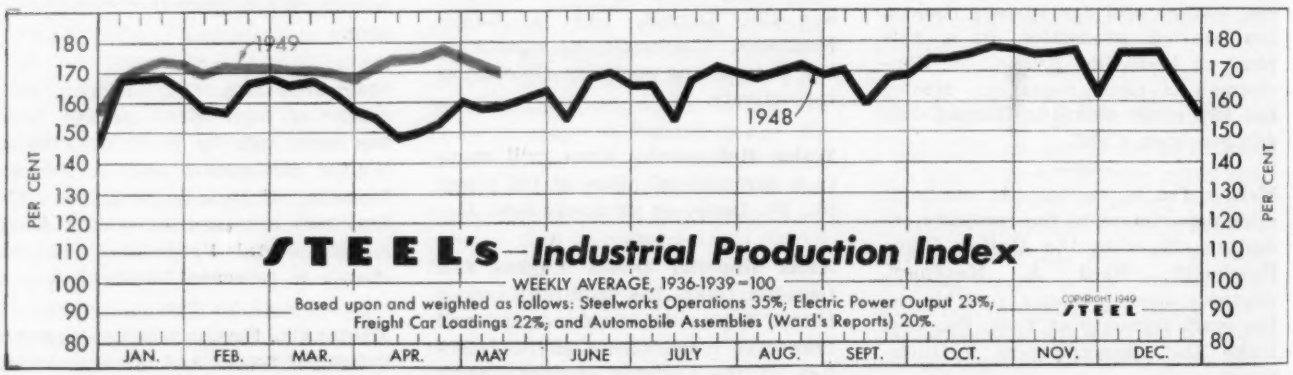
**STEEL**—Top output mark in steel is definitely past as production for ingots and castings dipped to 95.5 per cent of capacity in the week ended May 14, the lowest point thus far this year. This level is six points off from the year's high achieved during the week ended Mar. 19. Weekly operations, incidentally, in the years 1936-1939 (base period for STEEL's index) averaged 60.6 per cent of capacity.

**INVENTORIES**—Even the dikes of business inventories were lowered slightly as business waters receded. Total inventories at the end of March were $54.5 billion, according to the Commerce Department. This level was up about $50 million from February, but on a seasonally adjusted basis it represented a decline in book values. Durable goods stocks increased at the distributive levels and declined slightly in manufacturing.

**INCOME**—Personal income declined to an annual rate of $214.3 billion in March, $2 billion below the February level. The drop marked the third consecutive month in which personal income has fallen. At the current level the rate of personal income is still 4 per cent higher than in March, 1948, and slightly higher than the total for 1948. Decrease in total payrolls was larger in March than in either of the two preceding months, but some of this reduction was due to the miners' walkout.

**CONSTRUCTION**—In the ocean of factors affecting business activity, construction showed some improvement. Value of new construction put in place in April was almost $1.4 billion, a 10 per cent seasonal rise from March and 1 per cent under the level of a year ago, the Commerce Department reports. During the first four months of this year the total value of new construction amounted to $5 billion, about 4 per cent more than in the corresponding period of 1948. This increase resulted from a 43 per cent rise in public construction, more than offsetting the lag in private construction activity.

**TRUCKLOADINGS**—Motor carriers also are increasing their business. Volume of freight transported by trucks in March increased 12.1 per cent over February and 0.9 per cent over March, 1948, says American Trucking Associations Inc. Tonnage hauled by carriers of iron and steel increased 28.6 per cent over February and 48.1 per cent over March, 1948.




**Index (chart above): Week ended May 14 (preliminary) 168 Previous Week 171 Month Ago 174 Year Ago 159**

## BAROMETERS of BUSINESS

| INDUSTRY | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Steel Ingot Output (per cent of capacity)† | 95.5 | 97.0 | 99.0 | 94.5 |
| Electric Power Distributed (million kilowatt hours) | 5,257 | 5,284 | 5,343 | 5,109 |
| Bituminous Coal Production (daily av.—1000 tons) | 1,868 | 1,922 | 1,877 | 2,122 |
| Petroleum Production (daily av.—1000 bbl) | 4,899 | 4,897 | 4,912 | 5,423 |
| Construction Volume (ENR—Unit $1,000,000) | $131.0 | $129.3 | $158.2 | $149.2 |
| Automobile and Truck Output (Ward's—number units) | 116,563 | 130,113 | 131,821 | 83,275 |

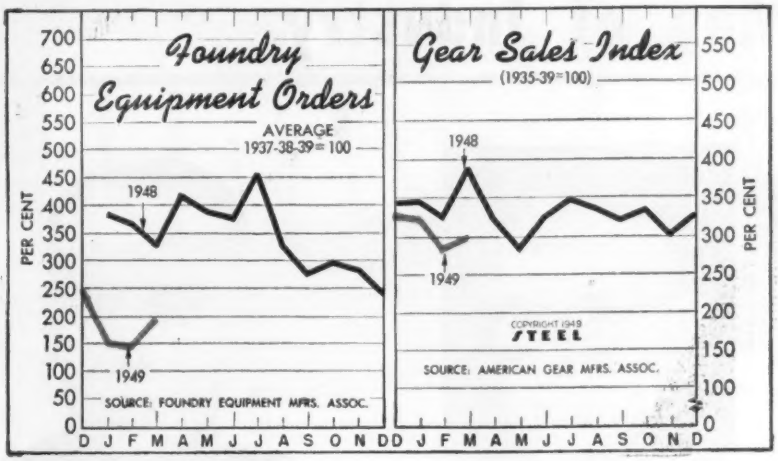
* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

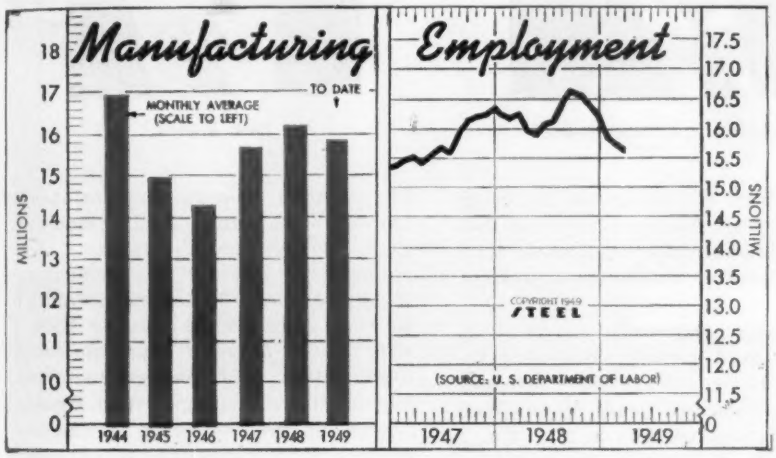
| TRADE | | | | |
|---|---|---|---|---|
| Freight Carloadings (unit—1000 cars) | 790† | 768 | 766 | 847 |
| Business Failures (Dun & Bradstreet, number) | 171 | 193 | 184 | 100 |
| Money in Circulation (in millions of dollars)‡ | $27,452 | $27,447 | $27,507 | $27,762 |
| Department Store Sales (changes from like wk. a yr. ago)‡ | +1% | −4% | +7% | +6% |

† Preliminary. ‡ Federal Reserve Board.

| | Foundry Equipment Orders* Index (1937-38-39=100) 1949 | 1948 | Gear Sales Index (1935-39=100) 1949 | 1948 |
|---|---|---|---|---|
| Jan. | 149.9 | 380.9 | 320.7 | 346.8 |
| Feb. | 144.4 | 367.3 | 282.3 | 324.4 |
| Mar. | 190.8 | 326.2 | 299.1 | 389.8 |
| Apr. | .... | 412.0 | .... | 320.9 |
| May | .... | 388.5 | .... | 283.6 |
| June | .... | 376.8 | .... | 324.1 |
| July | .... | 456.3 | .... | 348.4 |
| Aug. | .... | 324.7 | .... | 335.6 |
| Sept. | .... | 273.5 | .... | 320.4 |
| Oct. | .... | 296.0 | .... | 333.3 |
| Nov. | .... | 284.4 | .... | 309.0 |
| Dec. | .... | 243.7 | .... | 325.9 |

*By foundry trades only.


Foundry Equipment Orders
AVERAGE 1937-38-39=100
1948
1949
PER CENT
SOURCE: FOUNDRY EQUIPMENT MFRS. ASSOC.
Gear Sales Index
(1935-39=100)
1948
1949
COPYRIGHT 1949 STEEL
SOURCE: AMERICAN GEAR MFRS. ASSOC.
PER CENT
D J F M A M J J A S O N D D J F M A M J J A S O N D




**Factory Employment**

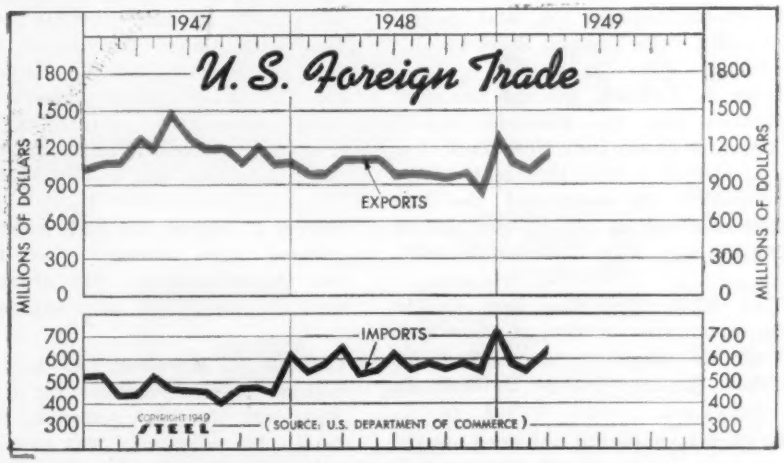
(000 omitted)

| | 1949 | 1948 | 1947 |
|---|---|---|---|
| January | 15,890 | 16,267 | 15,372 |
| February | 15,756 | 16,183 | 15,475 |
| March | 15,549 | 16,269 | 15,510 |
| April | ..... | 15,950 | 15,429 |
| May | ..... | 15,904 | 15,569 |
| June | ..... | 16,115 | 15,672 |
| July | ..... | 16,158 | 15,580 |
| August | ..... | 16,441 | 15,962 |
| September | ..... | 16,683 | 16,175 |
| October | ..... | 16,576 | 16,209 |
| November | ..... | 16,455 | 16,256 |
| December | ..... | 16,284 | 16,354 |
| Monthly Ave. | ..... | 16,274 | 15,794 |

**Foreign Trade**

Bureau of Foreign and Domestic Commerce
(Unit Value—$1,000,000)

| | Exports 1949 | 1948 | 1947 | Imports 1949 | 1948 | 1947 |
|---|---|---|---|---|---|---|
| Jan. | 1,086 | 1,092 | 1,114 | 589 | 547 | 531 |
| Feb. | 1,029 | 1,086 | 1,146 | 568 | 585 | 437 |
| Mar. | 1,152 | 1,139 | 1,327 | 632 | 670 | 444 |
| Apr. | .... | 1,121 | 1,299 | ... | 530 | 512 |
| May | .... | 1,102 | 1,503 | ... | 551 | 474 |
| June | .... | 1,015 | 1,320 | ... | 625 | 463 |
| July | .... | 1,019 | 1,265 | ... | 563 | 450 |
| Aug. | .... | 990 | 1,265 | ... | 606 | 400 |
| Sept. | .... | 926 | 1,109 | ... | 560 | 481 |
| Oct. | .... | 1,021 | 1,235 | ... | 600 | 492 |
| Nov. | .... | 820 | 1,138 | ... | 554 | 454 |
| Dec. | .... | 1,285 | 1,172 | ... | 720 | 603 |




## FINANCE

| | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Bank Clearings (Dun & Bradstreet—millions) | $12,273 | $13,909 | $12,004 | $12,899 |
| Federal Gross Debt (billions) | $251.6 | $251.6 | $251.5 | $252.2 |
| Bond Volume, NYSE (millions) | $15.0 | $14.1 | $12.3 | $28.5 |
| Stocks Sales, NYSE (thousands) | 4,052 | 4,693 | 3,712 | 13,174 |
| Loans and Investments (billions)† | $61.6 | $61.3 | $61.0 | $63.1 |
| United States Gov't. Obligations Held (millions)† | $33,263 | $32,951 | $32,397 | $35,640 |

† Member banks, Federal Reserve System.

## PRICES

| | | | | |
|---|---|---|---|---|
| STEEL's Composite Finished Steel Price Average | $93.55 | $93.55 | $94.91 | $80.27 |
| STEEL's Nonferrous Metal Composite‡ | 184.4 | 188.1 | 202.3 | 196.6 |
| All Commodities† | 155.9 | 155.2 | 157.6 | 163.7 |
| Metals and Metal Products† | 168.1 | 169.3 | 173.5 | 156.8 |

† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.

# Men of Industry

GROVER J. MEYER

FREDERICK C. SCHWENDLER

PAUL WATTS

**Grover J. Meyer** has been named president and director of Lombard Corp., Youngstown, designer and manufacturer of hydraulic equipment. He succeeds **D. L. Lombard,** who is chairman of the board of directors. Mr. Meyer, prior to his recent association with Lombard, was president and general manager of Renner Co. He formerly was connected with Arnold Co., Chicago, American Radiator Co., and as vice president with Truscon Steel Co.

—o—

**Ervin A. Arnesen,** general manager, Chicago Mfg. Co. Division, Revere Copper & Brass Inc., New York, has been elected a vice president of the company. He succeeded the late **Thomas Flack** as general manager of the Chicago Mfg. Division in 1947.

—o—

Blair Strip Steel Co., New Castle, Pa., announces election of **Thomas S. Blair** as president, succeeding his father, the late **George D. Blair Jr.**

—o—

**Edward L. Severing** has been elected assistant to the president, Standard Steel Spring Co., Coraopolis, Pa. He has been assistant secretary and assistant treasurer. **Louis P. Monk,** vice president, and general manager of the Gary, Ind., Division, has been elected a director.

—o—

**L. W. Clarke**, formerly general sales manager, Philip Carey Mfg. Co., Cincinnati, has been elected vice president in charge of sales, succeeding **E. W. Smith,** resigned.

—o—

Detroit Broach Co., Detroit, in expanding its services in Detroit, will have two representatives in the area. **Henry R. Schlachter** has been transferred from the Cincinnati office to succeed **Earl Hovey,** retired, as Detroit representative. Associated with Mr. Schlachter will be **Bob Strange.**

—o—

**Frederick C. Schwendler** has been appointed chief engineer, Stamping Division, Eaton Mfg. Co., Cleveland. For the past two years he has been plant manager of Falcon Mfg. Co., a subsidiary of Bowman Products Co., Cleveland. He had previous connection with Victor Electric Products Inc., Cincinnati; Parker Appliance Co., Cleveland; United Aircraft Products, Dayton, O.; Electrolux Mfg. Co., Old Greenwich, Conn.; and Western Electric Co. Inc. in New Jersey.

—o—

**Robert F. Myers** has been appointed general sales manager, Lees-Bradner Co., Cleveland. He previously held the position of sales engineer.

—o—

**Charles E. Heywood** has been appointed service engineer for Elastic Stop Nut Corp. of America, Union, N. J. He previously was associated with Chance Vought Division of United Aircraft as standards engineer.

—o—

**Harold J. Zilske** has been appointed sales engineer for Parker Appliance Co., Cleveland, in the Philadelphia area. For the past four years he has represented Anchor Coupling Co. in Ohio, Pennsylvania and New York.

—o—

To broaden activities of its Toledo, O., plant and of plants of recently acquired subsidiaries in Milan, Mich., Maumee Malleable Castings Co., Toledo, announces the following promotions: **E. H. Doering,** general manager, has been named executive vice president, and will devote most of his time co-ordinating sales of Maumee Malleable and American Boiler & Foundry Co., Milan. Assisting Mr. Doering in production, **N. P. Mahoney** has been promoted to plant manager at Maumee Malleable. In the Maumee Malleable sales organization, **R. E. Bossert** has been appointed sales manager. **H. M. Breese** has been named secretary of Maumee Malleable, in addition to being treasurer and purchasing agent.

—o—

**Paul Watts** has been appointed general sales manager of Skilsaw Inc., Chicago, manufacturer of portable electric and pneumatic tools. A veteran of 25 years in the electric tool field, Mr. Watts has been with Skilsaw Inc. for nine years, and has been Pacific Coast manager since 1947. He will shortly move his headquarters to Chicago after 22 years in the San Francisco territory.

—o—

**C. O. Wanvig** has been elected to the newly created position of chairman of the board, Globe-Union Inc., Milwaukee, and **Wyeth Allen** has been elected president of the company, succeeding Mr. Wanvig.

—o—

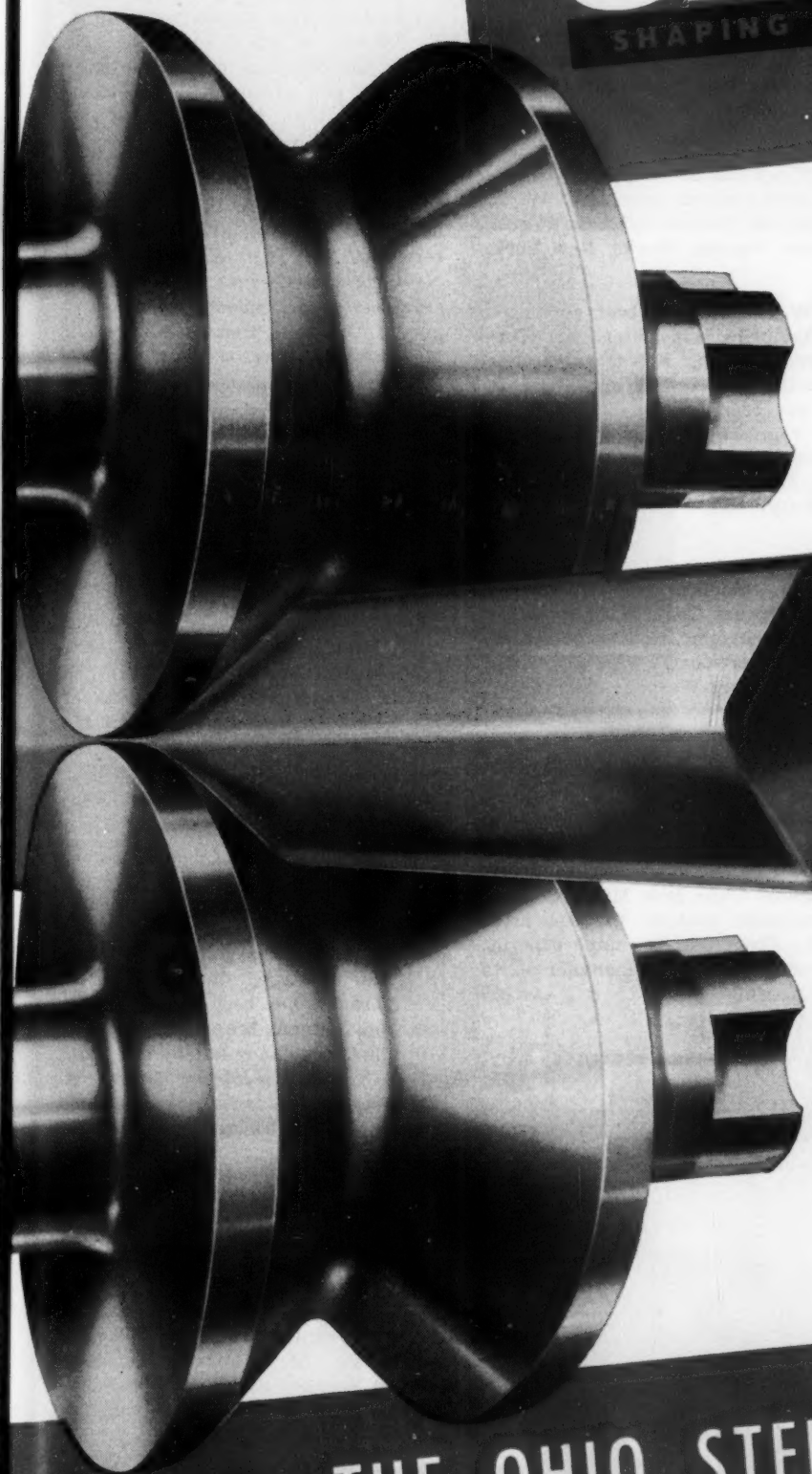
**Charles N. Hollingsworth Jr.** has been appointed sales manager, and **John H. Noble,** assistant sales manager of Dravo-Doyle Co., Pittsburgh. Mr. Hollingsworth has been associated for 25 years in the sale of road building and construction equipment for the company.

—o—

Norton Co., Worcester, Mass., in establishing a new region in the central United States, has appointed **Donald L. Price,** Detroit district manager, Abrasive Division, as manager,

# Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY



## STEEL... ON THE WAY WITHOUT DELAY

Greater production is the demand today. With Ohio Rolls doing their usual efficient job you can depend on more tonnage between dressings . . . healthier profits.

Select from any of these eleven types of Ohio Steel and Iron Rolls: Carbon Steel Rolls, Ohioloy Rolls, Ohioloy "K" Rolls, Holl-O-Cast Rolls, Chilled Iron Rolls, Alloy Chilled Iron Rolls, Denso Iron Rolls, Nickel Grair Rolls, Special Iron Rolls, Nioloy Rolls Flintuff Rolls.

## THE OHIO STEEL FOUNDRY CO

LIMA, OHIO

Plants at Lima and Springfield, O.

and also appointed **William A. Russell,** abrasive engineer in Toledo, O., to succeed Mr. Price at Detroit. The new area will include the territories around Cleveland and Detroit.

—o—

**John H. Moore,** superintendent, Louthan Mfg. Co., division of Harbison-Walker Refractories Co., East Liverpool, O., has joined the Pittsburgh office of Harbison-Walker as assistant divisional superintendent to **E. T. Hile.** He will be succeeded by **L. F. Sixt,** formerly plant manager for New Castle Refractories Co., New Castle, Pa.

—o—

**Jack F. Brossart,** until recently general sales manager, Industrial Filter & Pump Mfg. Co., Chicago, has been appointed Pacific Coast manager of the company. **Harold W. Faint,** recently manager of the Ion Exchange department, has been appointed general sales manager, succeeding Mr. Brossart.

—o—

**Roscoe M. Smith** has been named assistant director of the office of quality control, Ford Motor Co., Dearborn, Mich. He has been general manager, Parts & Equipment Mfg. Division, and will become director, quality control, in July, upon retirement of **Richard Kroll,** present director, who has had 44 years' service with the company.

—o—

**George L. Staudt** has been appointed advertising and sales promotion manager of Harnischfeger Corp., Milwaukee. He formerly was director of advertising for Standard Register Co., Dayton, O.

—o—

**James G. Gunderson,** purchasing agent for the past 13 years for Federal Products Corp., Providence, R. I., has been appointed sales engineer in the New England territory. **Harlan E. Gilson Jr.,** who has been assistant purchasing agent for the past eight years, succeeds Mr. Gunderson.

—o—

**Paul W. Hoeper** has been elected a director of D. J. Murray Mfg. Co., Wausau, Wis., filling the vacancy on the board caused by the death of the late **J. S. Alexander.**

—o—

Bound Brook Oil-Less Bearing Co., Bound Brook, N. J., has elected **W. R. Toeplitz** and **Samuel S. Connor** to its board of directors.

—o—

**Carl Bauer** has been appointed manager of industrial sales, and **W. E. Santoro** as director of laboratories, Standard Varnish Works, New York.

—o—

**Paul W. Erickson** has been appointed manufacturing superintendent, Electronics Division, Sylvania Electric Products Inc., New York. **John P. Vail** has been appointed distributor sales representative for the Radio Division of the company in Pennsylvania, Ohio, Michigan, West Virginia and Maryland.

—o—

**Allan M. Douglass,** formerly sales manager, Insulation Division, National Gypsum Co., has been named general manager, KoolShade-Storm-Shade department, Ingersoll Steel Division, Borg-Warner Corp., Chicago.

—o—

**Paul B. Entreken** has been appointed general manager, Mining Division, Bethlehem Steel Co., Bethlehem, Pa. He formerly was manager and vice president of the subsidiary company, Bethlehem Chile Iron Mines Co., assuming that position in 1944 after serving three years as mine superintendent and assistant manager of its El Tofo, Chile, mine.

—o—

**Helen J. Zeise** has retired as purchasing agent, Columbus Bolt & Forging Co., Columbus, O., after 40 continuous years of service. **Walter H. Canter,** associated with the company for many years as cost accountant and later controller, has been appointed successor to Miss Zeise.

—o—

Peabody Engineering Corp., New York, announces appointment of **A. P. Olches** as chief engineer. He joined the company in 1928 as sales engineer, and advanced to sales manager, and then to manager of research and development.

—o—

**C. C. Pinkney** has been placed in charge of the Brooklyn and Queens territory, N. Y., for A. Milne & Co., New York, succeeding **C. W. Schefer,** transferred to Connecticut as manager of the New Britain warehouse. Mr. Schefer succeeds **T. L. Talbot,** resigned.

—o—

**Bruce L. Stetter** has been appointed general manager, Export Division, New York office, Reynolds Metals Co., Louisville. He was formerly associated with the Export Division, Republic Steel Corp.

—o—

Taylor Wharton Iron & Steel Co., High Bridge, N. J., announces election of the following directors: **O. DeGray Vanderbilt Jr.,** chairman of the board; **O. DeGray Vanderbilt III,** executive vice president; and **William S. Rowe.** The company was merged last January with Weir Kilby Corp., Norwood, O., which was headed by the Vanderbilts.

—o—

Southern States Iron Roofing Co., Savannah, Ga., has announced personnel changes as follows: **John P. Starnes,** manager of the Orlando, Fla., branch, has been transferred to the New Orleans branch as manager. He fills the vacancy left by the death of **R. R. Summerville** in March. **A. J. Robertson** has been promoted from Birmingham sales representative to replace Mr. Starnes at Orlando, and is in turn succeeded at Birmingham by **Joseph M. Osborne,** transferred from the firm's Roanoke, Va., territory.

—o—

**William L. Garner,** formerly general night superintendent, Pratt & Letchworth Co. Inc., Buffalo, has been named service engineer, Pittsburgh Metals Purifying Co., Pittsburgh.

—o—

**James W. Hepburn** has been appointed assistant manager, Vertical Turbine Pump Division, Worthington Pump & Machinery Corp., Harrison,

GEORGE L. STAUDT

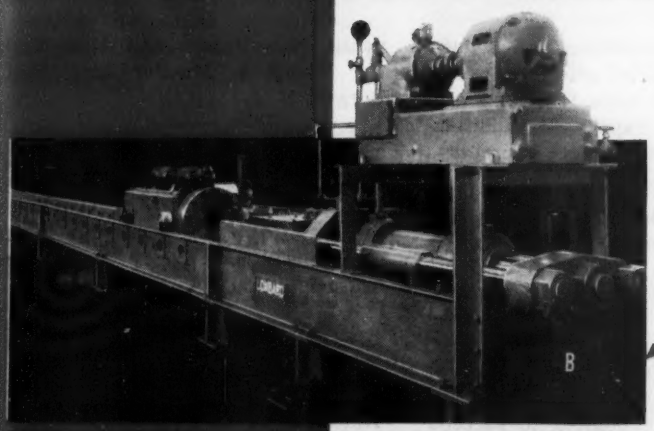
PAUL B. ENTREKEN

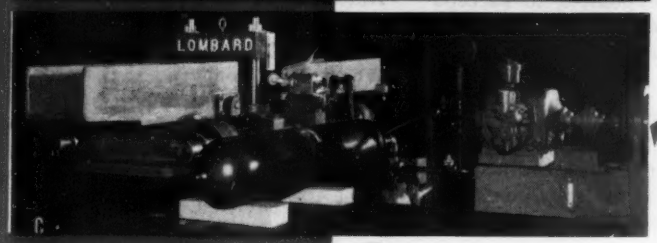


UNIVERSITY OF MICHIGAN LIBRARIES

# LOMBARD

All Lombard equipment is designed to meet your particular requirements. We invite you to investigate our facilities and products. All inquiries will receive courteous and prompt attention.



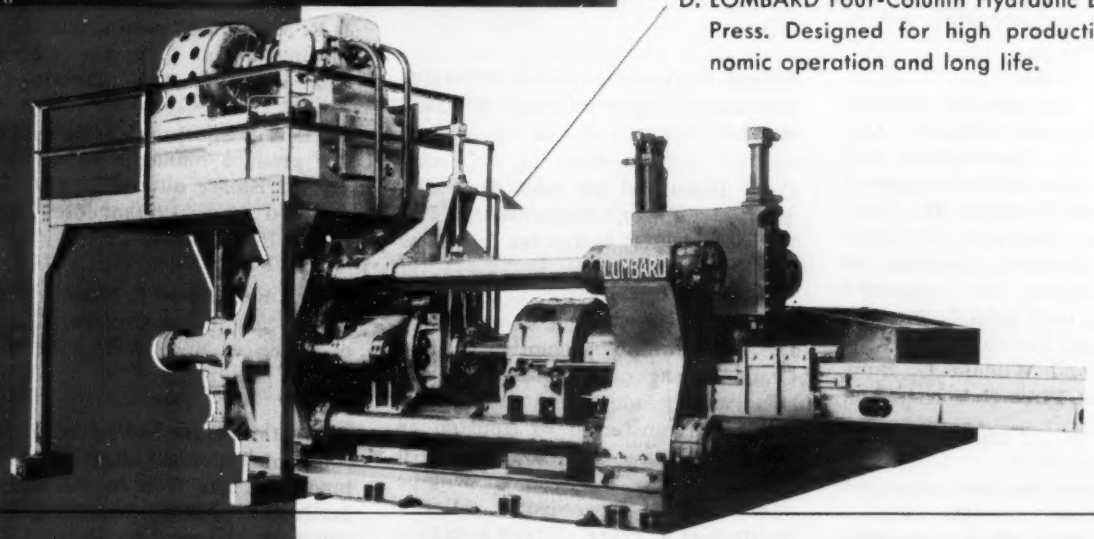




A. LOMBARD Hydraulic Press designed especially for baling jute.

B. LOMBARD Hydraulic Stretcher. Equipped with powered carriage and de-twisting head.

C. LOMBARD Hydraulic Test Bar Shear for cutting hot alloy steel bars while in motion.

D. LOMBARD Four-Column Hydraulic Extrusion Press. Designed for high production, economic operation and long life.




## LOMBARD CORPORATION

*Engineers and Designers*

**EMPIRE BUILDING · YOUNGSTOWN 3, OHIO**

**Equipment Manufactured by United Engineering and Foundry Co., Pittsburgh, Pa.**

MARVIN W. SMITH

HOWARD J. DAVIS

R. L. HANES

N. J. He will have headquarters at the corporation's Denver, Colo., Works.

—o—

**Marvin W. Smith,** executive vice president, Baldwin Locomotive Works, Philadelphia, has been elected president and chief executive officer of the company. He joined Baldwin in July, 1948, as executive vice president. He previously was connected for many years with Westinghouse Electric Corp., where in 1939 he was elected vice president of engineering and research. **Charles E. Brinley** was re-elected chairman of the board of Baldwin Locomotive Works.

—o—

**Jack N. Yetter** has been appointed district sales engineer in charge of the Tulsa, Okla., office, Twin Disc Clutch Co., and **Harry T. Peck,** district sales engineer operating out of the Dallas office.

—o—

**J. R. Lester,** manager of the Industrial Development Division, Alabama Power Co., Birmingham, has been made manager of the company's Rural & Towns Division. **H. Neely Henry,** assistant manager, Industrial Development Division, becomes its manager. Added to the company's board are **Maj. Gen. John C. Persons,** president, First National Bank of Birmingham, and **William C. Bowman,** president, First National Bank of Montgomery.

—o—

**Donald P. Gordon** has been appointed resident salesman under the jurisdiction of the Buffalo office of the Berger Mfg. Division, Republic Steel Corp., Cleveland. He will make his headquarters at Utica.

—o—

**Edward C. Ford** has been appointed assistant secretary of Jones & Laughlin Steel Corp., Pittsburgh, and of most of the corporation's subsidiaries. He has been an attorney in the legal department since 1948, and will continue in that capacity in addition to his duties as assistant secretary.

—o—

**Howard J. Davis,** who joined Colorado Fuel & Iron Corp., Denver, in 1940 to establish a Welded Wire Fabric Division centering at Pueblo, Colo., has been appointed assistant general manager, commercial steel sales, Western Division. **R. L. Hanes,** district sales manager at Fort Worth, Tex., has been appointed to succeed Mr. Davis as manager of sales, wire products, Western Division.

—o—

**George D. Ramsay,** vice president, Lone Star Steel Co., Dallas, has been appointed a member of the Iron & Steel Industry Advisory Committee of the Munitions Board in Washington.

—o—

**Roland D. Anderson** has been named manager of Dravo Corp.'s shipyard at Wilmington, Del.

—o—

**C. E. Hammond** has been appointed quality engineer, Shippensburg, Pa., Division of SKF Industries Inc., New York.

—o—

Link-Belt Co., Chicago, announces the following promotions: **Allan Craig,** manager, Southeastern Division, with headquarters in Atlanta, has been transferred to Houston as general manager of the Southwestern Division, where a new plant will be opened. He is succeeded at Atlanta by **Michael J. Perry,** district manager at Moline, Ill., and **Andrew K. Kolar,** district sales engineer at Moline, has been placed in charge of that office.

—o—

**John G. Kirkpatrick** has been appointed exclusive sales representative in the tri-state area of Pennsylvania, New Jersey and New York, for Kieley & Mueller Inc., North Bergen, N. J.

—o—

**Thomas J. Hilliard** has been elected a director of McConway & Torley Corp., Pittsburgh. He formerly was vice president in charge of sales, Carnegie-Illinois Corp., and retired in June, 1948.

—o—

**Donald C. Sheldon** has been elected assistant treasurer and **Kenneth A. Anderson,** assistant secretary of American Brake Shoe Co., New York. **Eads Johnson Jr.** has been appointed assistant vice president, Southern Wheel Division of the company. **James R. Shepard** has been appointed western district works manager, and **Thomas J. Wood,** eastern district works manager of the Brake Shoe & Castings Division.

—o—

**J. R. Mudler** has been appointed purchasing agent for the Cleveland plant of Oliver Corp., Cleveland.

—o—

**F. Ashton Smith** has been appointed foil product manager to direct the sale of Kaiser aluminum foil manufactured by Permanente Metals Corp., Permanente, Calif.

—o—

**Rear Adm. Clinton E. Braine,** U. S. N. (ret.), has joined Crucible Steel Co. of America, New York, as assistant to the president.

—o—

**C. B. Momberger** has joined the sales force of Universal Steel Co., Cleveland. He has been in the sales organization of Bethlehem Steel Co. for the past 11 years.

—o—

Reliance Electric & Engineering Co., Cleveland, has appointed additional field sales application engineers to the following districts: **Byron O. Lutman,** Detroit; **Robert C. Suttle,** Cincinnati; **William H. Chambers,**

Syracuse; **Robert L. Potter,** Pittsburgh; **William B. Maley,** New York; **Eugene H. Sowers,** Philadelphia; **J. Robert Zahn,** Cleveland; **Robert Magnetti,** Chicago; and **Robert B. Reed,** Birmingham. **Clyde F. Giegel,** who has served Reliance over a period of several years, joins the Pittsburgh office as a field service engineer. **Albert M. Cherry,** for the past two years associated with the Cleveland office, moves to the Rockford, Ill., sales office.

—o—

**George W. Altman** has been appointed foundry engineer, National Radiator Co., Johnstown, Pa. He will have headquarters at Johnstown, and will rotate among the company's foundries on behalf of engineering and metallurgical phases of foundry operation.

—o—

**Clay P. Bedford,** vice president in charge of manufacturing and a director of Kaiser-Frazer Corp., Willow Run, Mich., since its inception in 1945, has been named executive vice president.

—o—

**Peter P. Ruppe** has been appointed general manager of Hapman Conveyors Inc., Detroit. He has been chief engineer.

—o—

**William W. Ege** has been appointed to the newly created position of vice president of sales, Copperweld Steel Co.'s Wire & Cable Division, Glassport, Pa. He has been general manager of sales, and prior to that was located in the company's Chicago

ROBERT S. STRAWSBURG

*Resident field engineer in Europe for Warner & Swasey Co., Cleveland. Noted in STEEL, May 16 issue, p. 75*

CHARLES L. WOOLDRIDGE JR.

*Manager of sales training, United States Steel Corp., Pittsburgh. Noted in STEEL, May 16 issue, p. 72*

office in charge of western district sales. **F. E. Leib** was appointed assistant to vice president-sales, and **P. A. Terrell** was named assistant vice president.

—o—

**R. P. Connette** has been appointed assistant to the president, American Car & Foundry Co., New York. He joined the company's public relations department in 1945, and two years later was tranferred to the executive department in charge of the suggestion system and training program.

—o—

**Amos Johnson,** for many years associated with the welding industry of the Northwest, has joined the field sales department of Stoody Co., Whittier, Calif. He will assist Stoody distributors in Minnesota and the Dakotas.

—o—

**T. P. Stone** and **M. J. Cook** have joined the Wolverine Tube Division, Calumet & Hecla Consolidated Copper Co., Detroit, as salesmen. They will call on company accounts in Florida, Alabama, Georgia, Mississippi, Tennessee, North and South Carolina. Mr. Stone will temporarily headquarter in Atlantic Beach, Fla., and Mr. Cook will be in Atlanta.

—o—

**J. P. Williams Jr.** has retired from active management of Koppers Co. Inc. He has been chairman of the board. He served as president from 1939 until 1946.

## OBITUARIES . . .

**Joseph O. Eaton,** 75, board chairman, Eaton Mfg. Co., Cleveland, one of the five largest producers of automotive parts in the world, died May 15. From a small gear and axle company which he formed in 1911, Mr. Eaton incorporated Eaton Axle & Spring Co. in 1923, became its president and in 1925 its chairman. Following acquisition of numerous companies devoted to manufacture of auto parts, Eaton Mfg. Co. was incorporated as a holding organization in 1932.

—o—

**Dana J. Fox,** 60, president and treasurer, Fretz-Moon Tube Co., subsidiary of Republic Steel Corp. at Butler, Pa., died May 9.

—o—

**Charles F. Newpher,** 60, executive vice president, National Screw & Mfg. Co., Cleveland, died May 15. His earliest association with the nut and bolt industry was with Upson Nut Co., now a division of Republic Steel Corp., with which he was connected for 26 years, leaving as sales manager in 1937 to join National Screw & Mfg. Co.

—o—

**Stanley B. Waring,** 60, secretary-treasurer, Morse Chain Co., subsidiary, Borg-Warner Corp., Chicago, died at his home in Ithaca, N. Y., May 11.

—o—

**Floyd F. Oplinger,** 51, manager, electroplating service and development, electrochemicals department, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., died May 9.

—o—

**Dr. Arthur B. Yates,** 47, formerly chief geologist, International Nickel Co., New York, died in Montreal, Que., May 10 after a short illness.

—o—

**Clarence W. Avery,** 64, chairman of the board, Murray Corp. of America, Detroit, died May 13. He was president of the company from 1928 until his retirement last December.

—o—

**Charles T. Evans,** 76, vice president, Universal Cyclops Steel Corp., Bridgeville, Pa., died May 13 at Titusville, Pa., of a heart ailment.

—o—

**D. J. Neasham,** president, Ottumwa Iron Works, Ottumwa, Iowa, died recently.

—o—

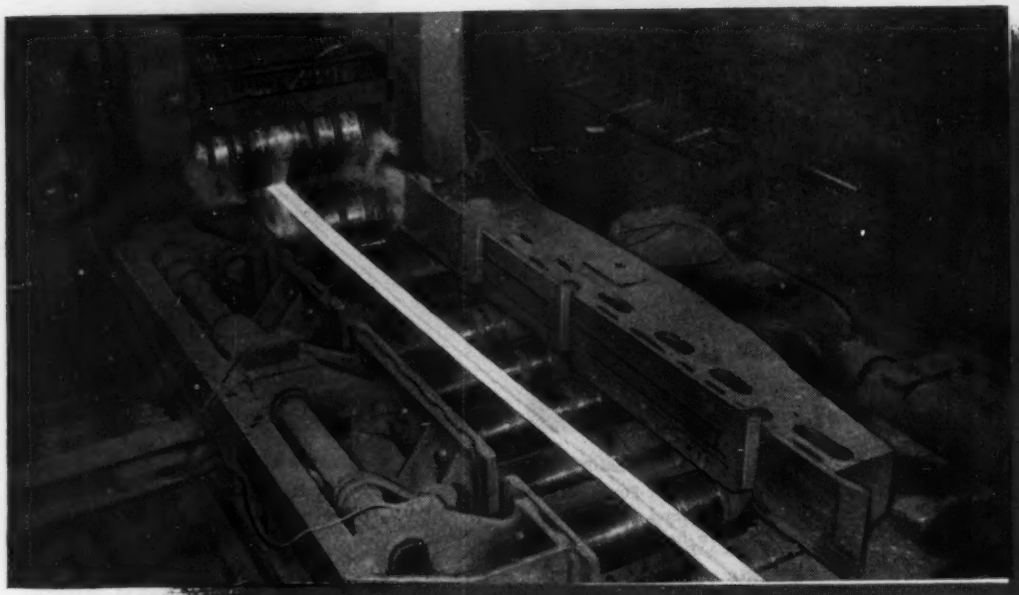
**Sarell W. Beal Jr.,** 39, Chicago credit manager, Carnegie-Illinois Steel Corp., died recently.

—o—

**Carl H. Loux,** 60, superintendent, Oxford, N. J., plant of Alan Wood Steel Co., died May 13.

—o—

**Samuel H. Martin,** 74, president, Northwestern Electric Co., Chicago, which he founded 46 years ago, died May 13.



# long on stamina

From ore dock to finished product, *quality control* watches over the entire process of making Wisconsin Steel. Here is steel of finest quality, carefully produced under the exacting standards of Wisconsin Steelmen.

The crankshaft of this International KB-10 truck is made of Wisconsin Steel—an important reason why this dependable truck delivers the goods. Wisconsin Steel —and International Trucks—are long on stamina.

INTERNATIONAL HARVESTER

**WISCONSIN STEEL COMPANY, Affiliate of INTERNATIONAL HARVESTER COMPANY**

**180 North Michigan Avenue, Chicago 1, Illinois**

# WISCONSIN STEEL

# Engineering News . . . AT A GLANCE

**STUDIES "MAGNESIUM" IRON—** Over 200 diesel engine and compressor parts are now being studied by Cooper-Bessemer Corp., Mount Vernon, O., for possible gains to be made by the use of magnesium-treated cast iron. According to the company, components to withstand high working pressures such as compressor heads, bodies, liners and valve seats as well as engine parts like crankshafts, flywheels and cross heads are included in the study. The Ohio concern is reported to be the first to receive a license to produce this high strength ductile iron from International Nickel Co.

**"TUMBLE-BUG" FIXTURE—** Extensive use of arc welding and close control of production methods are two chief factors that enable the Michigan City plant of Pullman-Standard Car Co. to produce complete 40-foot box cars at the rate of 1 every 10 minutes. Many special jigs and fixtures take a prominent role in the rapidly-moving production line. Welds on the center sill, for example, are made on a clever fixture called a "tumble bug" in which parts start at the top of a series of inclined platforms, where two welders put in the welds on one side. Each sill is then permitted to roll down the platform a quarter turn to the next station, where two more operators weld the next side. This operation is repeated through one whole revolution of the sill, at which point it has reached the bottom of the incline where the job is completed.

**HEAT VIA LIQUID METAL—**Liquid metal is the medium through which heat created by atomic fission will be transferred to the heat exchanger to produce steam in the experimental atomic power plant being built near West Milton, Saratoga County, N. Y., it was learned through General Electric Co. According to Dr. Robert F. Bacher, only physicist member of the Atomic Commision at the GE-operated plant, heat energy will be removed from the reactor by circulating the metal in liquid form. Plans are to utilize the heat carried off by the liquid metal to generate electrical energy. The setup also will be used to test the possibility of breeding new fissionable material with intermediate energy neutrons.

**STUB AXLE MOUNTING—** Each car of the streamlined Spanish Talgo train recently completed by American Car & Foundry Co., STEEL, p. 54, May 2, is actually mounted on two wheels. Thus weight of the front end of each car is supported by the car in front of it, and front end of the first car is supported by load bearing members of the locomotive. Instead of having a truck under each end of the car with axles extending from wheel to wheel, each car is suspended on two stub axles, one on each side of the car, so that passengers walking through the train are between the wheels. Axles are connected by a U-shaped nonrotating axle to maintain gage.

**"VERTICAL CASTING"—**Mass production method for centrifugally casting large chromium-nickel stainless steel cylinders in permanent molds is currently used by Cooper Alloy Foundry Co., Hillside, N. J., to meet specifications in the American version of Englands's famous Nene jet engine. Vertical rather than horizontal axis casting machines are employed which are said to produce sound castings with no internal shrinks or tears. Alloy used contains about 25 per cent chromium, 12 per cent nickel and 3 per cent tungsten.

**BROAD WELD TEST —** Resistance-weld failures are minimized by a quality control method applied to diversified joining operations such as those encountered in the fabrication of switchgear components. The method, according to R. S. Inglis, superintendent of inspection and quality control in the Switchgear Divisions of General Electric, offers assurance of uniform weld results on a process where visual inspection leaves much to be desired (p. 90)

**OUTPUT DOUBLED—**Latest facilities included in the Midland, Pa. Works of Crucible Steel Co. of America are reported to virtually double the company's output of stainless and specialty steels. Processing capacity of a new hot mill is 27,000 tons of ingots monthly. The Works as a unit now is rated at a potential ingot capacity of 95,000 net tons monthly. By-product coke oven facilities were increased by 84 units to total 184 ovens—capable of producing 1800 tons of coke daily. (p. 94.)

**BULK PROCESSING —** Means of "packaging" and mode of handling are vitally important in setting up a traffic system of "flowing" materials in a plant with industrial trucks. Principle on which power trucks are operated is one of intermittent movement of individual pieces or composite loads; that of the unit load method is based on theory that the more pieces or pounds moved in a single operation, the lower the cost and the shorter the time needed As sound as these principles are, neither will hold true unless effective planning and judicious selection are exercised. (p. 98)

**PLATE MAKING—**Methods of processing plates have progressed a long ways since the days when charcoal iron blooms were pounded by tilt hammers operated by water wheel power or hand sledging. Today chief tools of a plate mill are rolls. Some five general types of rolls are in use. Majority of these are cast, but some are forged. They vary from 12 to 206 inches in length and from 7 to 54 inches in diameter. (p. 114)

# Resistance-Weld

## Minimized by Test Method Applied to Diver

QUALITY control of resistance welding, in shops handling a large variety of work, has been effectively accomplished and provides a working example of statistical control as applied to manufacturing processes. These points were brought out by R. S. Inglis, superintendent of inspection and quality control, Switchgear Division of General Electric Co., Philadelphia, in a recent discussion of the application of quality control methods to resistance welding operations before the Western New York section of the American Welding Society, in a joint meeting with the American Society for Quality Control. According to the speaker, they have developed a satisfactory method for controlling the quality of their resistance welding—even though welding conditions are very diversified in the fabrication of switchgear equipment.

Prior to introduction of quality control in fabricating shops, relatively little testing of weld quality was done. What was done, involved a crude hammer-test to destroy the weld while the sample piece was held in a vise. Thus, if the operator was able to tear a hole in the parent metal, it was considered a good weld; if the piece failed, the operator would change his set-up. Then there was always a chance the operator would pass up the test. The quality control technique described is currently applied to the diversification of welding required in the fabrication of switchgear equipment, a typical example of which is shown in Fig. 3, illustrating a cubicle which has been completely fabricated by resistance welding. A cubicle of this type is made of various types of material, such as 1/16 and $\frac{1}{8}$-inch panel steel; 3/16 and

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# dFailures

## iedtoiversified Joining Operations

*This quality control technique offers assurance of uniform weld quality on a process where visual inspection leaves considerable to be desired, and makes possible the use of resistance welding on assemblies where high quality must be maintained at all times*

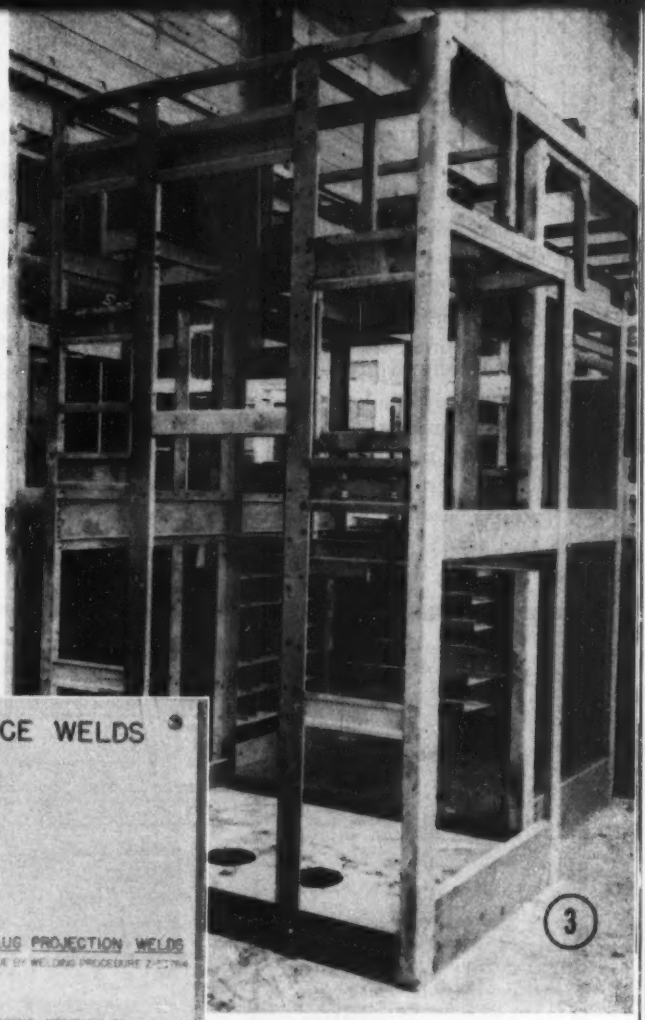



*Fig. 1—Typical machine used in quality controlled welding operations*

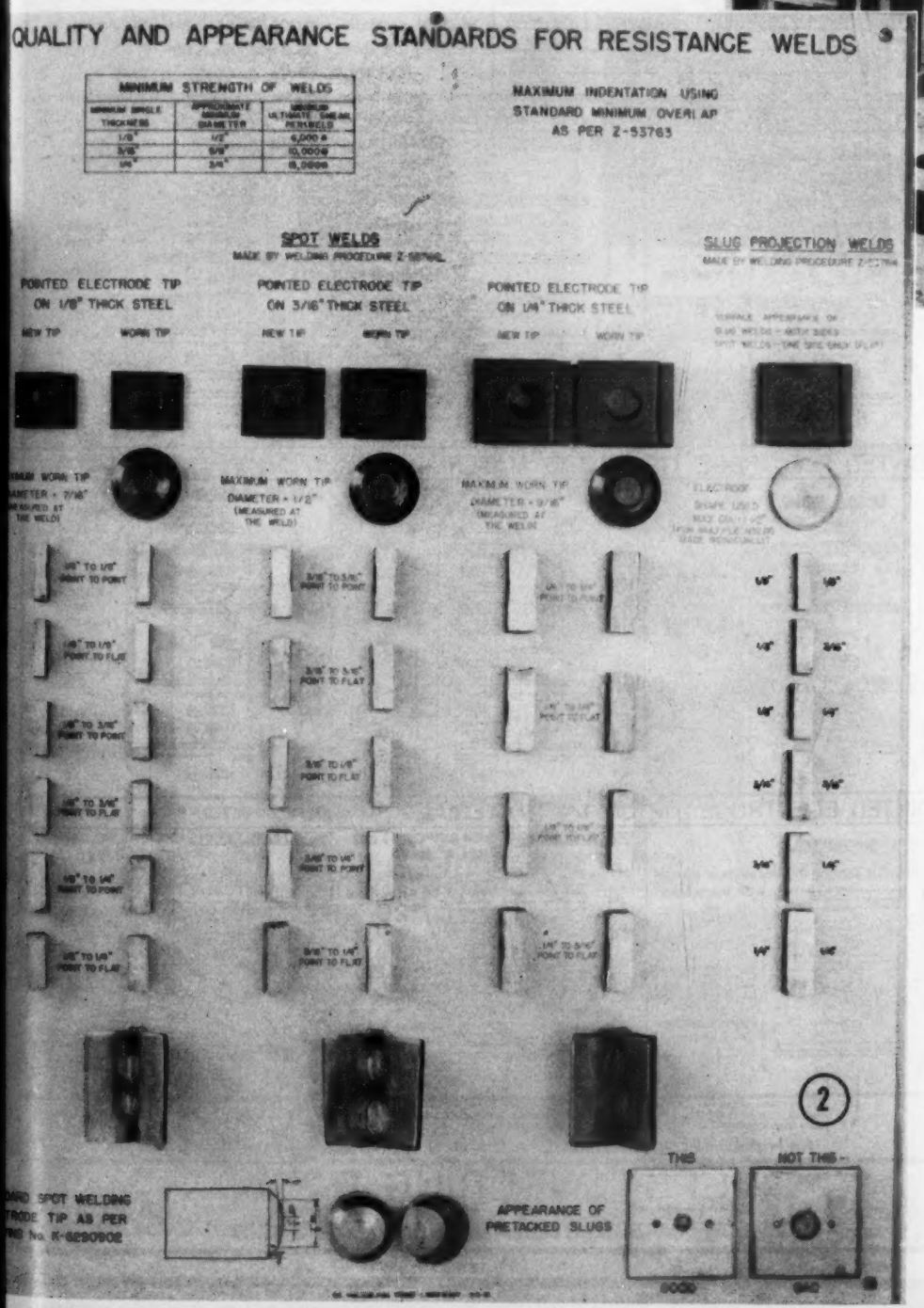

QUALITY AND APPEARANCE STANDARDS FOR RESISTANCE WELDS
MINIMUM STRENGTH OF WELDS
MAXIMUM INDENTATION USING STANDARD MINIMUM OVERLAP AS PER Z-53763
SPOT WELDS
SLUG PROJECTION WELDS
POINTED ELECTRODE TIP ON 1/8" THICK STEEL
POINTED ELECTRODE TIP ON 3/16" THICK STEEL
POINTED ELECTRODE TIP ON 1/4" THICK STEEL
NEW TIP
WORN TIP
MAXIMUM WORN TIP DIAMETER = 1/2" (MEASURED AT THE WELD)
MAXIMUM WORN TIP DIAMETER = 9/16" (MEASURED AT THE WELD)
2
APPEARANCE OF PRETACKED SLUGS
THIS
NOT THIS

*Fig. 2—Quality and appearance standards for resistance welds. This chart also illustrates the maximum worn tip diameter for different steel gages*

*Fig. 3—Switch gear cubicle which has been completely fabricated by resistance welding. A weldment of this type is made of various kinds of steel and has approximately 2000 spot welds*

¼-inch plate steels; ⅛-inch manganese steel, and ¼-inch structural steel, and has approximately 2000 spot welds.

With the introduction of quality control in welding processes, employing a standardized welding technique, it is important to have properly calibrated, reliable welding machines. Welding machines at their division are equipped with thyratron synchronous controls to assure that once the machine has been set for a definite procedure, all of welds made will be consistent. Fig. 1 shows a typical machine. Note that the adjustors for the thyratron control panel, the current regulator, the sequence panel, and the air circuit breaker, as well as the pointer-stop ammeter and pressure gage, are conveniently located on the front of the machine, readily accessible to the operator.

By means of plug-in jacks, calibrations of the machines are checked at regular intervals; thus it is only necessary for the operator to set the controls, using the applicable welding procedure. Once the machine has been adjusted, consistently good welds should be obtained. However, it is necessary to periodically check the results to guard against malfunctioning of the welding machine, parts inconsistencies, or variation in operator performance. A stable supply of electric power is essential to insure consistent performance.

**Calibrating Welding Machines** — Standardization of the welding procedure is essential to the statistical

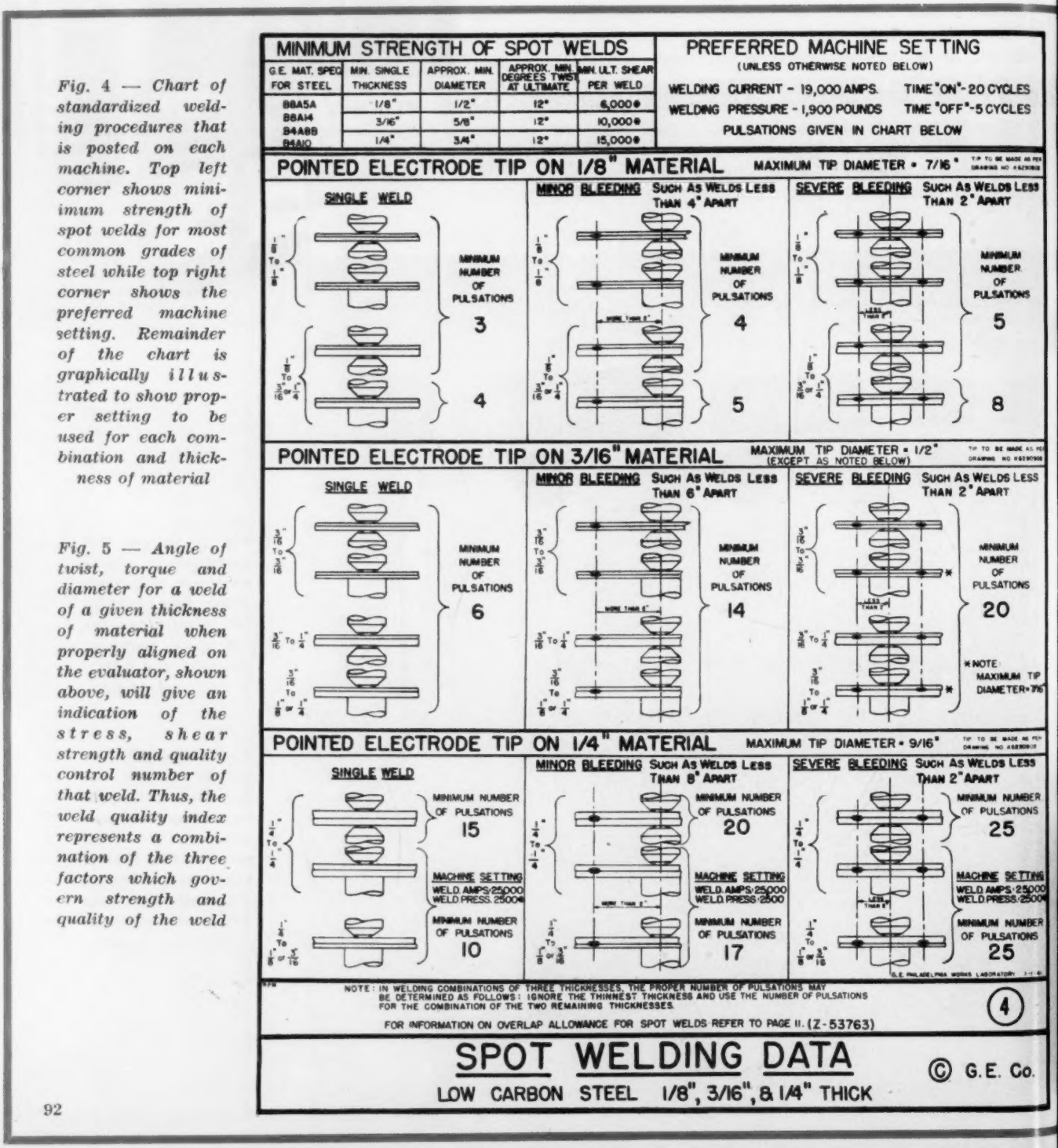


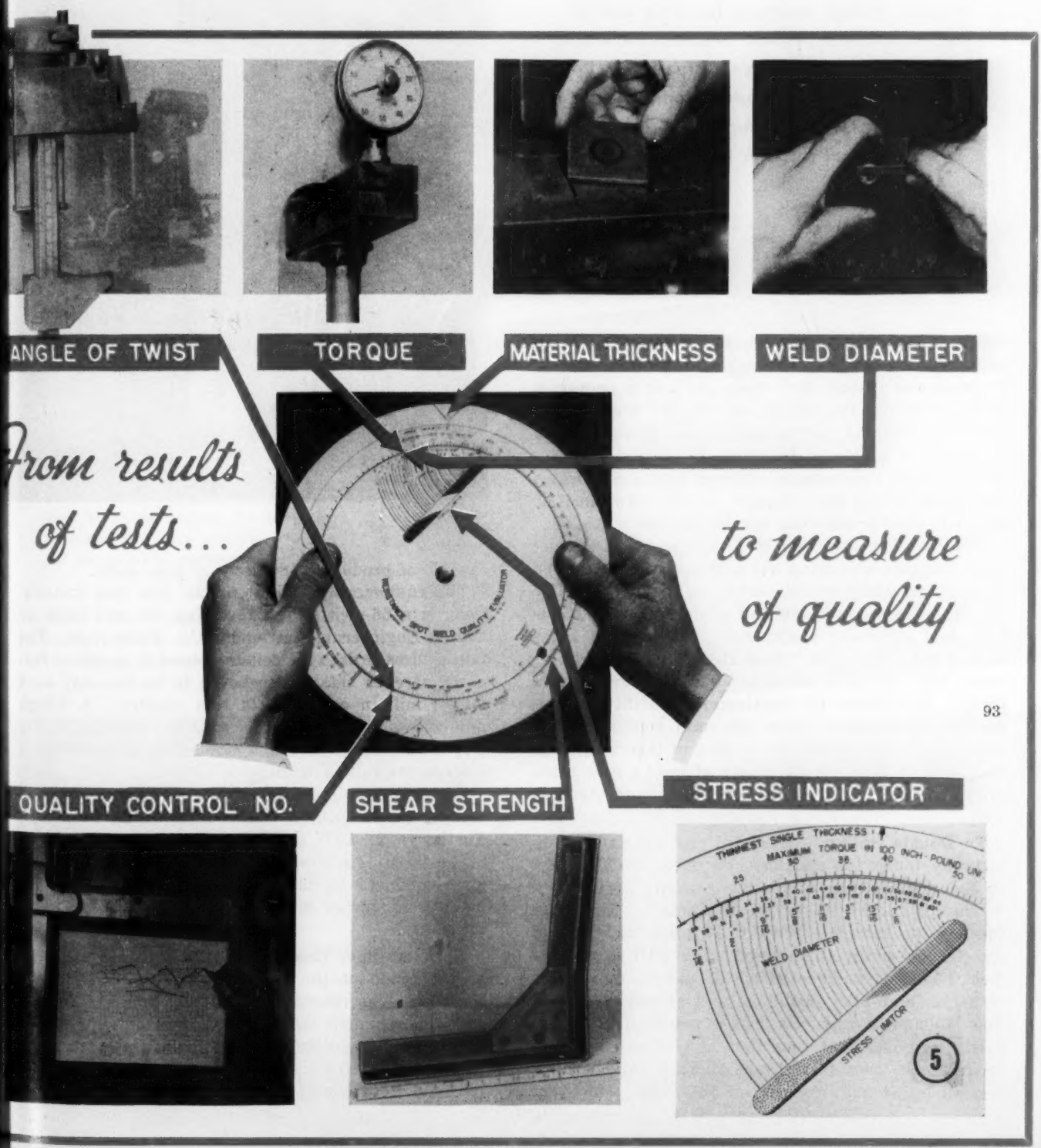

*Fig. 4 — Chart of standardized welding procedures that is posted on each machine. Top left corner shows minimum strength of spot welds for most common grades of steel while top right corner shows the preferred machine setting. Remainder of the chart is graphically illustrated to show proper setting to be used for each combination and thickness of material*

*Fig. 5 — Angle of twist, torque and diameter for a weld of a given thickness of material when properly aligned on the evaluator, shown above, will give an indication of the stress, shear strength and quality control number of that weld. Thus, the weld quality index represents a combination of the three factors which govern strength and quality of the weld*

control of the process. Suitable tables, giving the proper settings of the welding machine controls, must be made available to operators so that adjustments can be effected to secure the best possible results for the conditions of each job. These settings, which are too important to be determined by any approximate methods, make it possible for any operator to work on any machine.

On highly repetitive jobs, it is only necessary to establish the proper welding procedure once, and then continue on that basis for the job duration. However, when welding conditions are variable, as in the case of fabrication of switchgear equipment, it is necessary to have a specific procedure for each combination of materials. The necessary data was collected, based on many tests in which a number of welding factors were varied and the chart of standardized welding procedures, shown in Fig. 4, was posted on each machine. At the top right hand corner is shown the preferred machine setting. The remainder of the chart is graphically illustrated to show what setting is to be used for each combination and thickness of material. As can be seen, the number of pulsations vary, depending upon the position of the pointed electrode and the proximity of adjacent welds.

**West Testing** — Structural stability of assemblies produced by use of resistance welding depend chiefly upon two factors: Quality of the component parts and of welded joints. Quality of the component parts can be controlled by the (*Please turn to Page* 111)

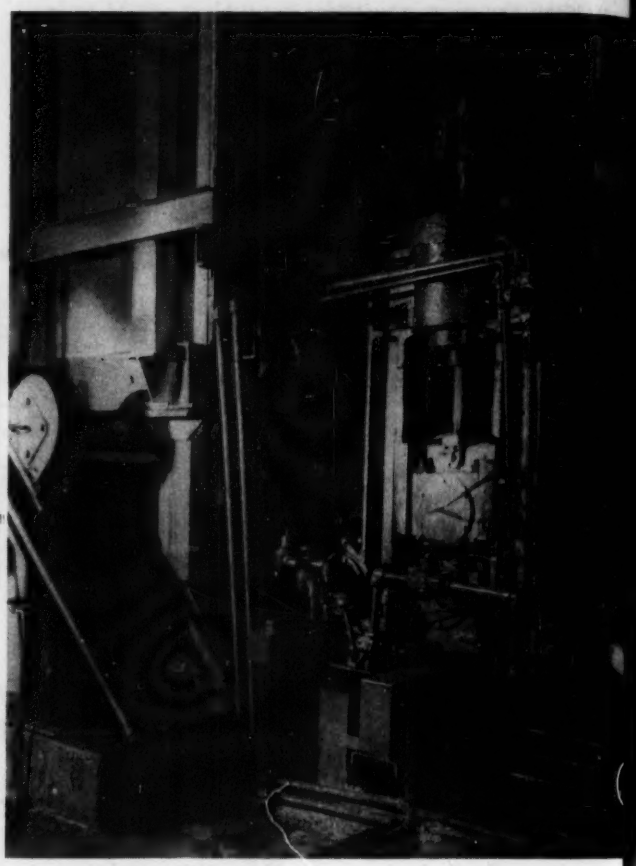


## Alloy Strip

# HOT COILED DURING REVERSING PASSES

### At Crucible's Midland Works

*Reels operating in overhead gas-fired furnace on either side of mill serve the new 66-inch, 4-high reversing hot strip mill in the Midland, Pa., plant. Modern facilities for cold finishing stainless steels are included among latest installations, besides means to prevent damage of product in transit through the mill*



FIRST complete hot and cold-rolled sheet and strip mill facilities designed throughout for production of stainless and special alloy steels are now in operation at the Midland, Pa., Works of Crucible Steel Co. of America. Entirely contained within three-quarters of a mile of connected buildings, the new mill equipment, costing approximately $18 million, incorporates the latest technology applied to the problems of specialty steel production, notably stainless.

The new hot and cold mill equipment to supplement company's existing hot mill facilities had to be of the type which would permit maximum flexibility for output of widely diversified products such as stainless steel strip and plate; mild, medium and high-carbon strip and plate; tool steel; high manganese steel; disk and plow steel; in all widths, grades and forms. To achieve the maximum versatility in production of specialty steels, the mill equipment has been designed to permit the rolling of ingots to slabs and slabs to strip on all grades of steel. Also some grades of steel may be rolled direct from ingot to strip.

**To Double Output** — Designed and constructed to virtually double the company's output of stainless and specialty steels, the processing capacity of the new hot mill is 27,000 tons of ingots monthly. Two blast furnaces provide pig iron for 11 open hearths and six electric arc melting units. The melting department has been augmented by 10 and 15-ton electric furnaces, and alloy handling and storing facilities. The Midland Works now has a potential ingot capacity of 95,000 net tons monthly. Company's by-product coke oven facilities at Midland have been increased by 84 units to total of 184 ovens, which are capable of producing 1800 tons of coke daily.

The equipment highlight of the new mill installations is a 66-inch 4-high reversing hot mill built by United Engineering & Foundry Co., Pittsburgh. The mill utilizes drum type coilers housed in gas-fired furnaces at each side, and believed to be the only such 4-high mill in operation in this country. A 2-high mill with coilers and furnaces is in operation in Detroit and a 4-high reversing hot mill is in operation in Canada for rolling mild steel.

As tooled, the mill has rolled strip from 1 to 0.076-inch in thickness and widths from 15 to 50 inches. Further reductions and greater widths will be produced later. At present the mill will roll the widest strip produced on mills of this type and it is ultimately capable of rolling sheet and strip up to 62 inches wide.

**Furnaces Save Heat**—By use of furnaces and reels at each side of the mill, temperature can be conserved and/or retarded, permitting rolling to wider and thinner strip dimensions. It is anticipated the mill will make possible reduction of hot strip to thinner gage than on conventional mills. Better control and maintenance of gage and improved surfaces

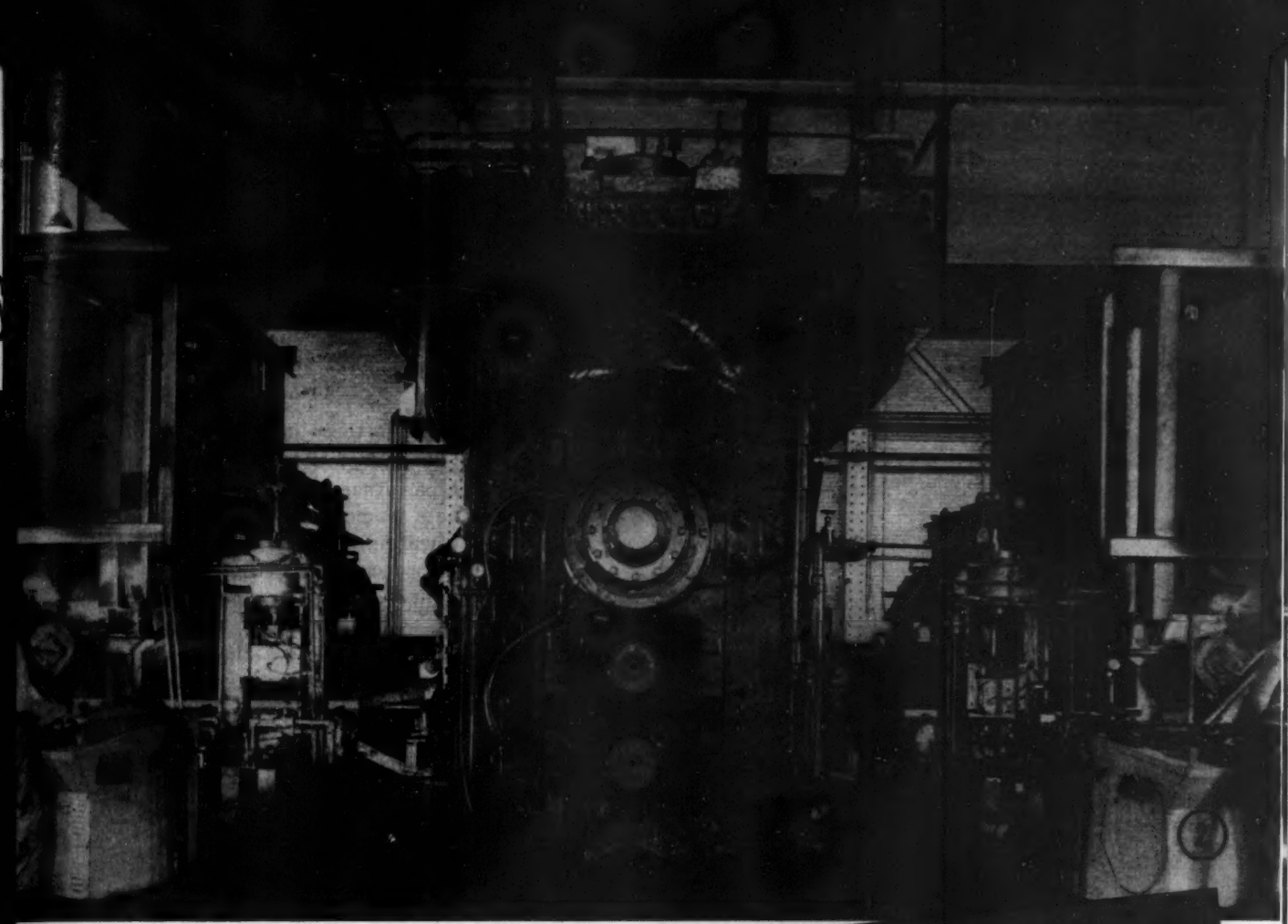
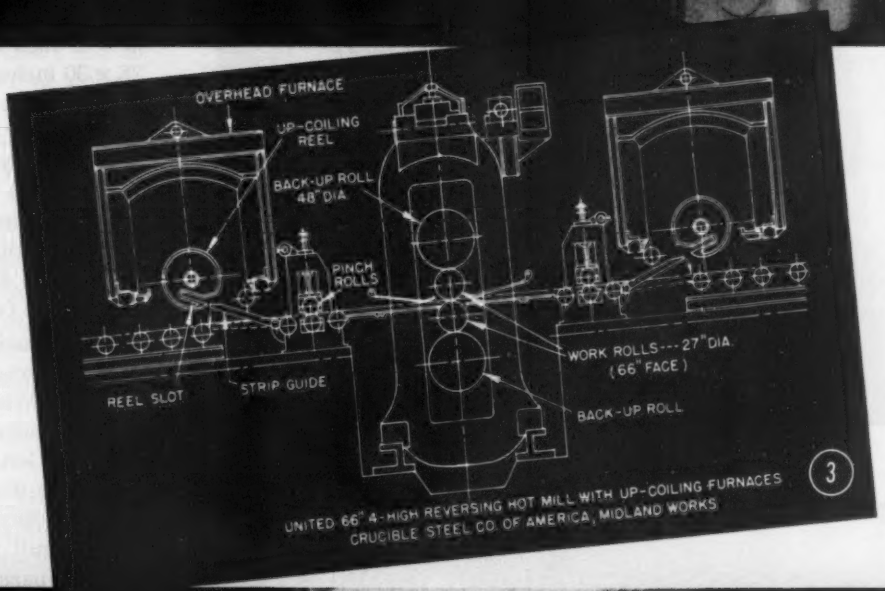


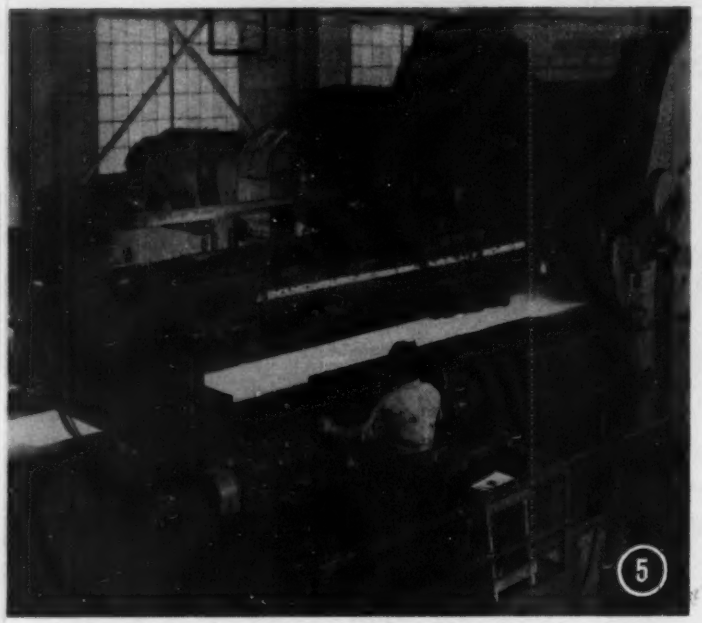
*Fig. 1—Closeup of pinch rolls and one hot recoiling furnace of 66-inch, 4-high reversing mill*

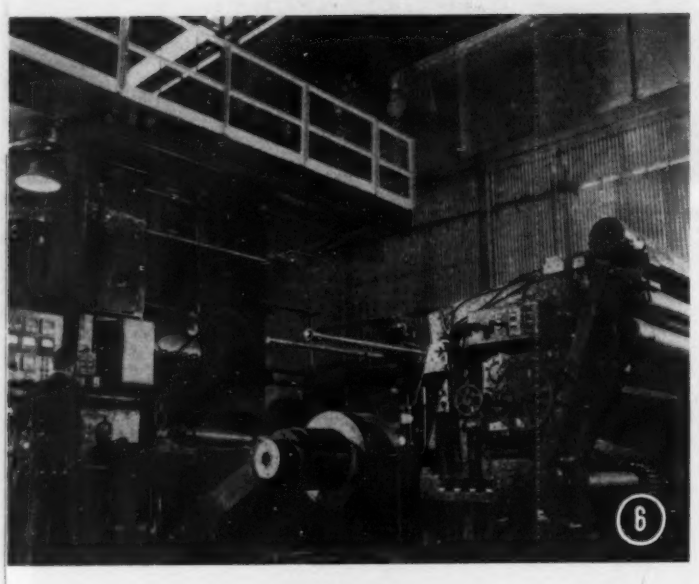
*Fig. 2—Four-high reversing mill is served by pinch rolls and up-coiling furnace on either side*

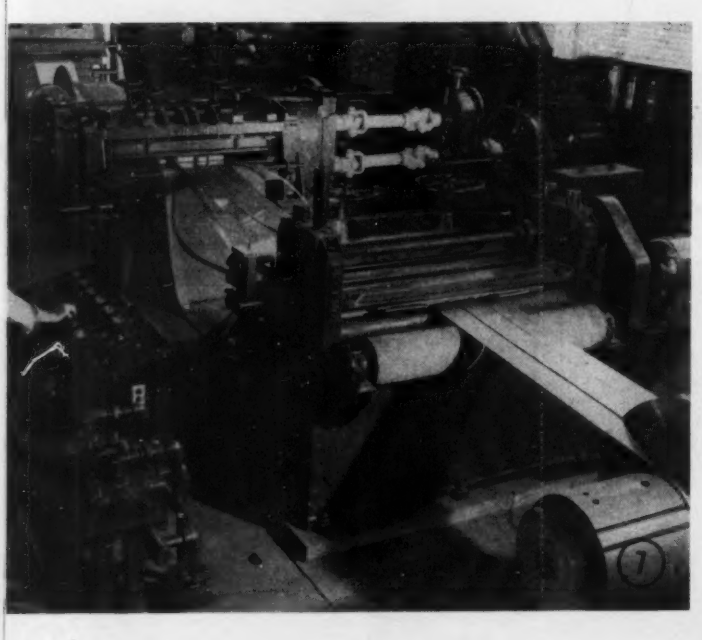
*Fig. 3—Cross section of 66-inch reversing hot mill showing principal components and method of hot coiling strip*

*Fig. 4—Mandrel type hot strip up-coiler. Upender at left is shown placing coil on conveyor*









and finishes are expected to be produced on the tough alloy steels. In the case of stainless this type mill should be a definite advantage from the economical and operational point of view.

A 14,000 square foot stripper and ingot storage building is located at the head of the hot mill line. Ingots from open-hearth or electric furnaces are stripped and prepared for furnace charging or stocked in this buidling. Ingots range from 9 x 15 to 20 x 55 inches and weigh from 1100 to 24,000 pounds. Charging cranes to handle these ingots consist of a 5-ton Morgan crane and a new 10-ton Alliance crane.

Ten batch type furnaces have a hearth area of 660 square feet and a temperature range of 2150 to 2380° F. The usual heating cycle for ingots is 5 to 8 hours although certain special steels require up to 24 hours. Coke oven gas or natural gas is normally used, with oil as a standby fuel.

**Mill Line**—The first mill on the line is a 2-high 32 x 72-inch broadside nonreversing mill with a double reduction 1500-horsepower drive. This mill is used for scale breaking and cross-rolling of slabs to increase their width. The next unit is a 2-high, 32 x 69-inch reversing slabbing mill with a 5000-hp direct drive. This mill reduces ingots to slabs of desired thickness and reduces slab thickness to that of strip-plate for further reduction in the 4-high reversing hot mill. Operating in conjunction with this mill is a 2-high reversing edging mill with vertical rolls 28 x 30 inches.

A Morgan 64-inch guillotine slab shear crops slabs to specified length and rough sections of strip-plate before it reaches the 4-high hot mill. The slab conveyor is 20 feet wide with a counterbalanced chain which carries slabs from the rolling line to the adjacent conditioning buildings. Here, slabs are ground or scarfed and stored to await transfer back to the batch-type furnaces.

The principal equipment on the hot line is the 66-inch United 4-high reversing hot finishing mill and its hot up-coiling Dun-Mar furnaces. The work rolls are 27 inches diameter and are direct driven by a 5000-hp General Electric motor. The backup rolls are 48 inches diameter and are operated by 100-hp screwdown motors.

This mill is capable of rolling 1200 fpm. Ordinarily, five passes of the strip are sufficient to attain the finish gage. Lighter gages than are possible on the usual tandem stainless mill may be obtained, due to maintenance of temperature by the reheat furnaces.

Backup rolls have Morgoil bearings and the work rolls are fitted with roller bearings. A Farval automatic lubricating system (*Please turn to Page* 106)

*Fig.* 5—*Morgan slab shear cropping ends of strip plate before it enters reversing hot mill*

*Fig.* 6—*56-inch 4-high reversing cold reduction mill with maximum speed of* 850 *feet per minute*

*Fig.* 7—*Multiple slitting line,* 54*-inch, equipped with uncoiler and leveler,* 60*-inch shear and electrically-operated roller strip guide*

## SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
*Machine Tool Editor*

**BEAT OF THE TOMTOM:** As I sat through the sessions of the 47th spring meeting of National Machine Tool Builders' Association at Edgewater Beach Hotel, Chicago, I became aware that I was being subjected to repeated impact of "investment". The mental effect might almost be compared to that of the constant beating of tomtoms which could be heard throughout the play called "Emperor Jones".

First came Jerome Raterman's paper, "Are We Giving Away Invested Capital?" Next, "Investment for Survival," by Lloyd McDonald. Beat of the tomtoms continued with "Investment in Europe," by Tell Berna; "It's Still the World's Best Investment," by James C. Hebert; "Investment in Youth," by J. Edward Goss; and finally, "Investment in Community Relations," by L. W. Scott Alter.

While this constant emphasis on "investment" probably stemmed out of the Association's recent book, "The World's Best Investment," an interpretation of modern production machine tools in terms of their phenomenal earning power on the investment which they represent, it was by no means confined to that—except in the case of Mr. Hebert's talk.

For example, Mr. Raterman probed the capital structure of the metal working industry and presented the conclusion that its capital should be measured in machines rather than in dollars. In many cases it will be found that half the amount of the equipment—if purchased new today—will cost the same amount in dollars as all the equipment did 10 years ago. That means that the number of dollars set aside for replacement of equipment should be doubled. Too few financial men realize that—even though they do recognize the depreciation of the dollar in other respects.

Mr. McDonald voiced the conviction that survival of Western civilization depends to a considerable degree upon the machine tool industry. It carries on in the belief that human ingenuity always can contrive some way to do things better and cheaper than they were done before, thereby multiplying human output so that there will be more for everybody. Hence his statement that investment in machine tools is "investment for survival".

Mr. Goss asked this question: "What are we doing about that investment without which all the other investments are of little value—our investment in future managers, superintendents, sales directors, designers, research engineers, foremen and mechanics?" That question certainly is an important one. Just before the Chicago meeting one of the leading members of the industry told me of a case where a company failed to get needed new capital simply because investment houses discovered that it had no program for replacement of its engineers and executives.

Never one to pull his punches, L. W. Scott Alter packed a solid one in his demand for heavier investment in community relations on the part of machine tool builders. Here is what he said in conclusion:

"How do the Communists work? Do they have a big national headquarters in New York or Washington to put out all their material? You know they don't! They have 'cells' in every community. They may have an individual cell right inside a plant. From the very beginning they have operated on a local, grass-roots, personal contact basis. You can't laugh them off—not any more.

"Isn't it time we learned something from this competition? I think it's time our industry started a lot of cells in this country. I believe—if we work it right—we can make every machine tool plant in the United States a capitalist cell, from which the basic principles of our Free Enterprise System—and the part that mechanization plays in employment and in raising the standard of living—can be spread through our plants and through our communities. Education—like charity—begins at home!"

**ROLL TURNING BY "TRACER":** Those who cling to the notion that tracer controlled turning is confined to delicate work must be thinking about the sort of "engine turning" practice as a hobby by aristocrats in the days of Marie Antoinette. Tracer control now is being applied successfully to turning of chilled iron and cast steel rolls used in steel mills.

Roll turning always has been surrounded with mystery—its practice being confined to relatively few shops and to a small group of artisans. Under their traditional system, almost unmachinable materials have been machined through a combination of massive lathes operating at extremely slow speeds, and massive form tools which "crunched" the metal away under the impulse of wedges and massive screws actuated by sledge hammers.

On May 11 I was privileged to attend a demonstration at Monarch Machine Tool Co., Sidney, O., where it was proved that, with the help of carbide tools and tracer control, sledge hammers can be dispensed with and rolls turned and contoured in one-third the traditional time.

The lathe in which this was proved is a heavy duty machine of 32-inch swing. It doesn't look much different from any good heavy duty engine lathe. It does, however, have internal gear drive to its face plate—similar to the table drive of a vertical boring mill. Also, it has a rugged "live" tail stock, bearings of which duplicate those of the headstock spindle. Then too, its feed works—actuated by the Keller system from a sheet metal templet embodying the contour of the roll—is equipped with unusually husky hardened lead screws.

Two things make possible this new roll turning technique. One—already mentioned—is carbide tooling. The other is conviction on the part of Monarch men that old problems can be solved in new ways.

*Fig. 27 — Gas tractor hauling trailer train. Courtesy Mercury Mfg. Co.*

By WALTER F. TOERGE
*Associate Editor, STEEL*

# EFFICIENT HANDLING METHODS

## Can Cut Production Costs

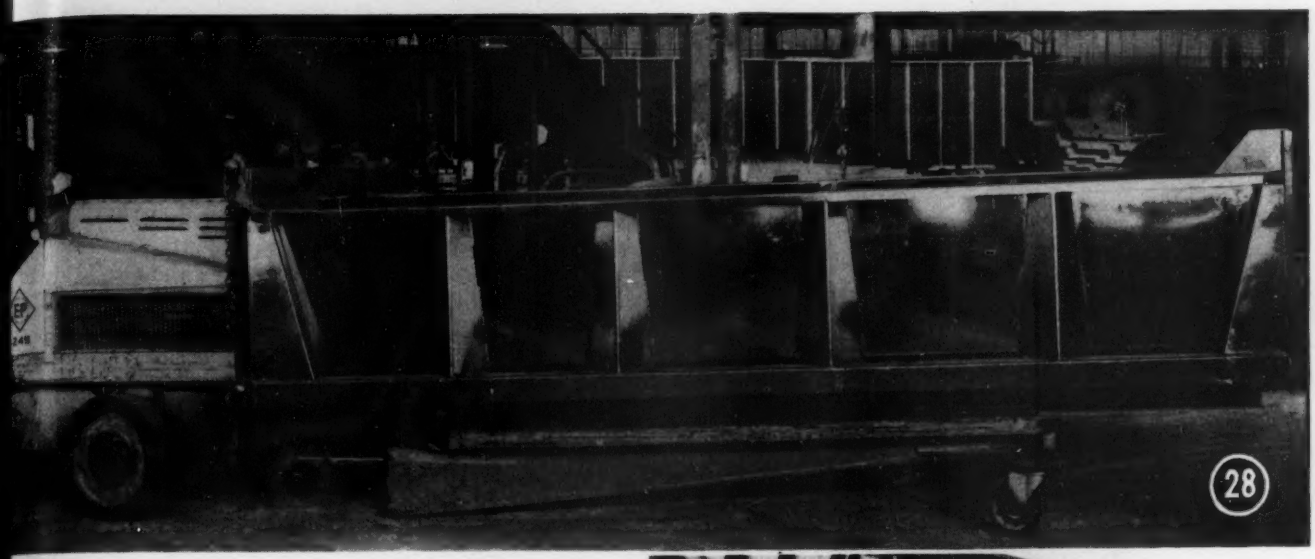
**PART IV OF THE CURRENT SERIES**

INDUSTRIAL trucks are possibly the most universally-used powered handling aids in the metalworking industry. In the form of tractors, nonelevating, low-lift and high-lift platform trucks, powered hand trucks, fork trucks and as special equipment, they operate in machine shops, foundries, forge shops, fabricating and assembly plants, steel mills and in receiving and shipping departments. The handling principle upon which all power trucks are employed is one of intermittent movement of individual pieces or composite loads, usually on pallets or skids, over various routes and at speeds from about 90 to 500 feet per minute.

Battery electric, gas electric and gas mechanical are the three sources of power for industrial trucks. Fields of application for maximum efficiency, are, of course, determined by such physical considerations as floors, grades, clearances, one-story or multistory buildings, elevators, doors, loading docks. Among the other requirements that must be weighed are: Building ventilation, keeping cost records, duty-cycle records, providing facilities for charging and exchanging batteries, training operators, routing and dispatching and maintenance.

**Unit Loads**—Before discussing applications of the various types of industrial trucks, it would be well to examine the unit load method of handling materials. The idea is extremely simple: "The more pieces or pounds moved in a single handling operation, the lower the cost per piece or per pound and the shorter the time required to move any given volume."[19] Advantages of a system based on this principle are equally obvious: Maximum utilization of storage space, reduced product damage, more worker safety, less time needed to load railroad cars and trucks, in addition to increased speed of handling. According to one estimate, up to 68 per cent of the manhours expended in unloading a railroad freight car, can be saved by this method.

In most plants, general handling procedures are pretty much alike. They consist of receiving, placing in raw storage, processing, assembling, packing, warehousing and shipping. The entire cycle is accelerated by adapting all types of loads to four dis-

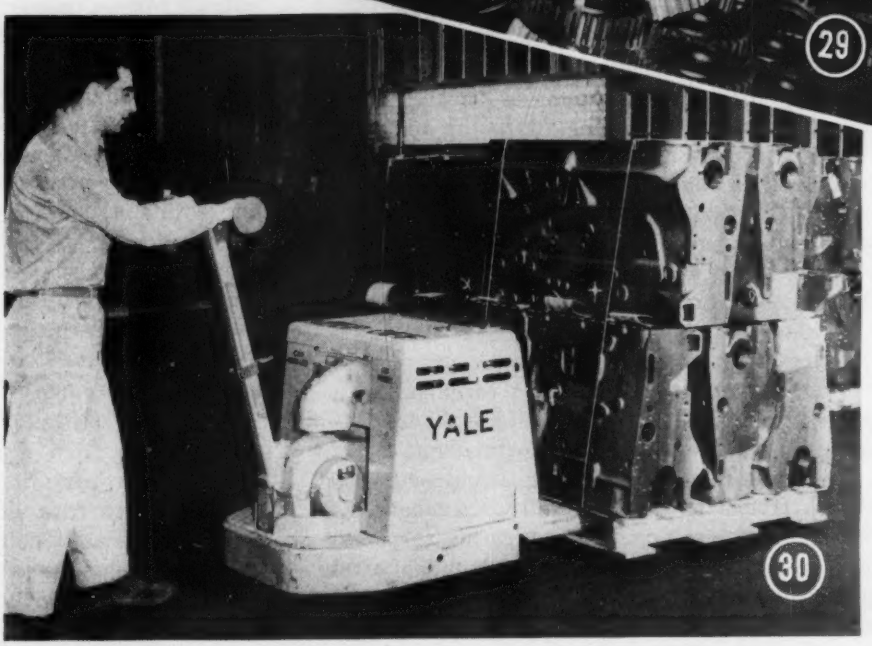



*As a major factor in reducing handling costs, the unit load method of transporting and storing materials is finding wide acceptance industrially. Some economically sound applications of the single load idea, using tractors, platform and powered hand trucks with various types of carriers such as skids and pallets are described here*

*Fig. 28—Long, heavy objects such as the dump truck body shown here can be transported easily by means of a two-wheeled dolly and a low-lift platform truck. Courtesy Elwell-Parker Electric Co.*

*Fig. 29—Close-quarter spotting of loads, using an industrial truck with hydraulic lift unit. Courtesy Schwitzer-Cummins Co.*

*Fig. 30—Powered hand truck handling unit pallet load of motor blocks. Courtesy Yale & Towne Mfg. Co.*



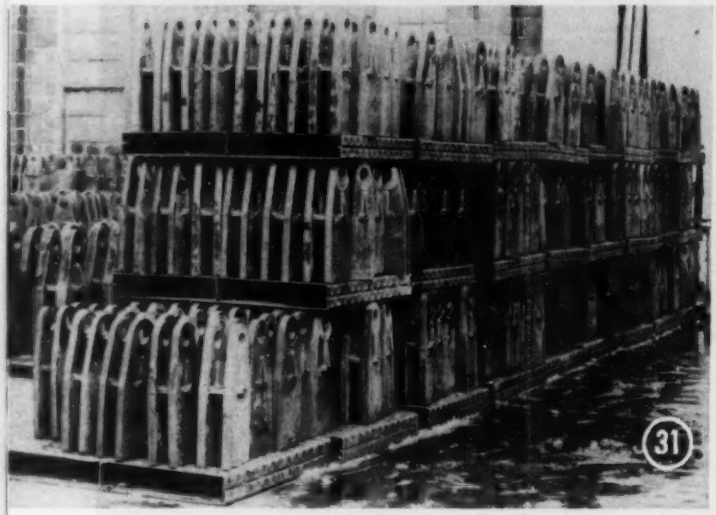


*Fig. 31—Double deck steel pallets handling odd-shaped steel plate weldments. Courtesy Union Metal Mfg. Co.*

tinct types of containers—boxes, barrels, bags or bales and then collecting the greatest possible numbers of these containers into unit loads and transporting the loads as single units.[20]

Tractors capable of pulling long trains of trailers furnish a means of transporting large quantities of materials cheaply over long distances. The trailers, or wagons, are relatively inexpensive and the single source of motive power (the tractor) can be kept in almost continuous use while the wagons wait for loading or unloading. Tractor-trailer combinations represented the first attempt at really large-scale purely horizontal handling in manufacturing plants, receiving and shipping departments and in warehouses. They still have many applications in metalworking factories. In some plants, where movement on the horizontal is less than 200 to 250 feet, fork trucks transport parts, packages or pallets. For transporting greater distances, materials are loaded on trailers and hauled in long trains by industrial tractors.

**Platform Trucks**—Straight platform trucks are similar to tractor-trailer systems in that they have no means of loading and unloading themselves, but must be assisted by fork trucks, hoists, and other equipment capable of vertical motions. Low lift and high lift platform trucks, however, are engineered to raise and lower skids or pallets of materials vertically and also to carry horizontally. Low lift trucks, as the name suggests are capable of raising the load only a few inches off the ground, whereas the high lift units can raise the loads a matter of several feet.

Use of elevating platform trucks and steel skid boxes in forge shops is widely accepted practice in handling raw materials and finished forgings, both ferrous and nonferrous. One average size plant making forgings for automobiles, engines, machine tools, trucks, coal mining and road-building equipment uses six platform trucks to service 12 drop hammers, 12 steam hammers, 2 upsetters, 8 heat treating furnaces, 3 barrel-type sand blast cleaners, 1 tumbling barrel cleaner. More than 1500 tons of steel is consumed each month in the form of bar stock up to 5 inches in diameter, cut to lengths weighing 2 to 90 pounds. Both bars and forgings are transported in steel skid boxes in 1 to 5-ton loads. Platform trucks handle all this material and in addition move hammer parts and dies and coal in dump buckets mounted on skids.

Steel flows from cars to storage, to shears, furnaces, hammers, cleaners, heat treating, inspection and shipping. In the forge shop and heat treating department trucks carry loads of steel in skid boxes up to the furnace doors. After heat treating, and while the furnaces are still hot, the doors are opened and the forgings raked out into the skid boxes and removed for cooling.

In another valve-manufacturing plant, tanks of quenching oil are mounted on steel skids, picked up by trucks and moved to the furnaces. Heated parts are raked directly into the oil. Trucks then pick up the tanks and carry them away to cool.

In foundries, skid racks and gas or electric elevating platform trucks handle green cores. At the shakeout operation, rough castings are commonly dumped into skid boxes like those used for carrying forgings. Dump hoppers can be set aside, loaded and then carried and dumped by industrial trucks which serve tumbling mills for both hard and annealed castings. Scrap dumped from hopper trailers is charged into furnaces; ladles of molten metal move via industrial trucks betwen cupolas and pouring floors.[21]

A manufacturer of bearings and bushings, using a large tonnage of strip steel and other metals truck-handles coils in skid loads of 12,000 to 15,000 pounds. Transported to the annealing ovens on 5-ton trucks, the strip, still on skids, is annealed in ovens heated to 425° F. Shells blanked directly from strip steel and heat treated before bearing metal is applied are placed in skid boxes and trucked to the heat treating department. Next they are removed from boxes, placed in ovens, reboxed and then transported to the finishing machines.[22]

Powered hand lift trucks with either platforms or forks, perform duties not unlike those handled by platform trucks, that is, moving skid, pallet or bin-loads of covered materials and parts. Scope of hand lift truck operation is different, however. Distances are shorter and speeds slower and volumes smaller. Lifting mechanims on this type of equipment are mechanical, hydraulic or electrical. Trucks are built in almost any size, capacity (1000 to 20,000 pounds or more) and for practically every conceivable application within the field. Length, width, height and weight of loads to be carried, plant floor conditions, inclines, elevators, aisles, doors, etc., are a few of the pertinent factors controlling the selection of hand lift trucks. Hand trucks handle pallet and skid loads where the distance traveled and weights carried do not require powered equipment.

In loading and unloading freight cars and trucks, moving parts from one processing operation to another, maneuvering in confined storage spaces, cooperating with fork lift trucks and other handling equipment in manufacturing plants, hand and motorized lift trucks find their greatest use. Hand lift trucks are particularly adaptable to carrying loads between machine operations; power trucks on the



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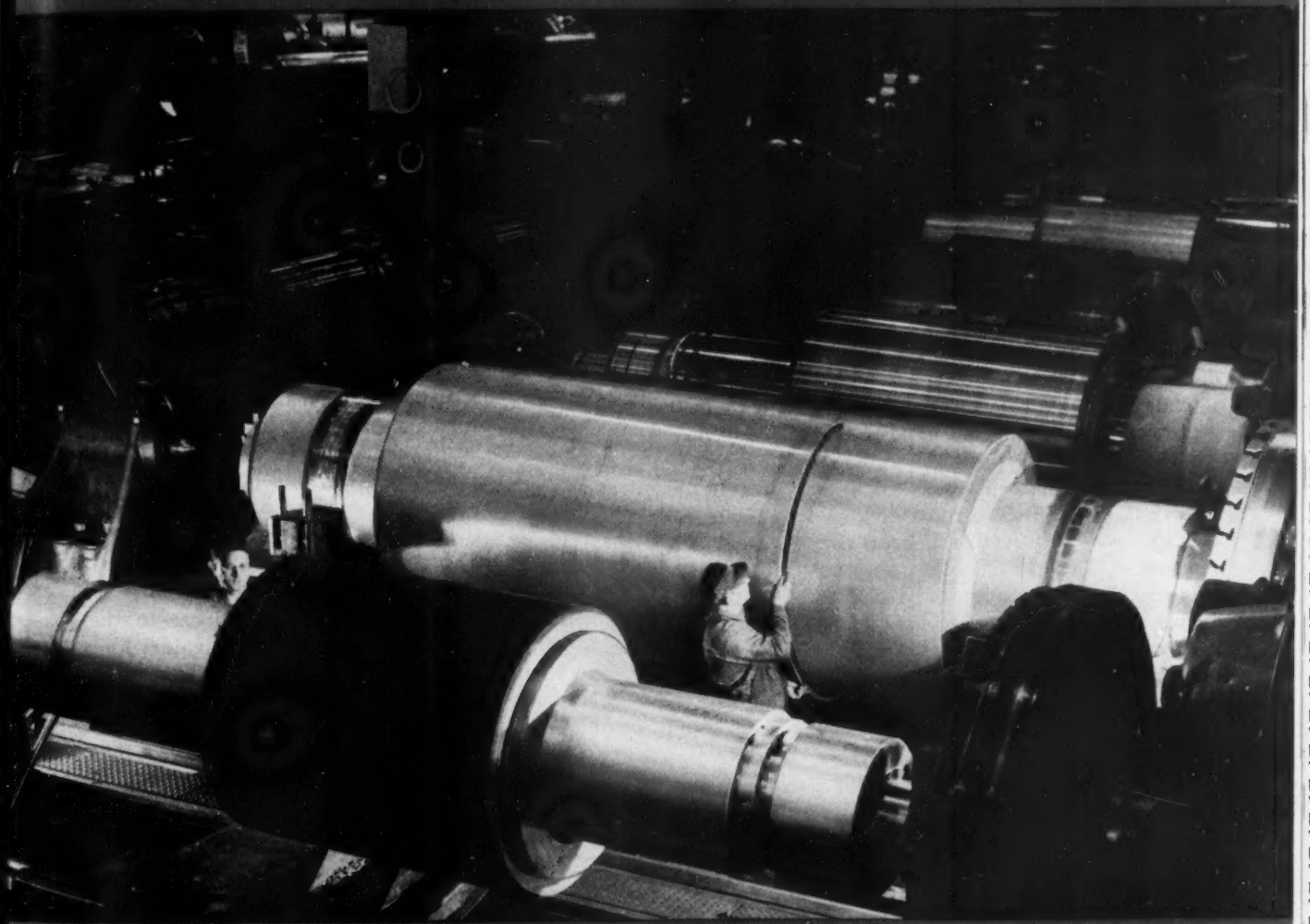

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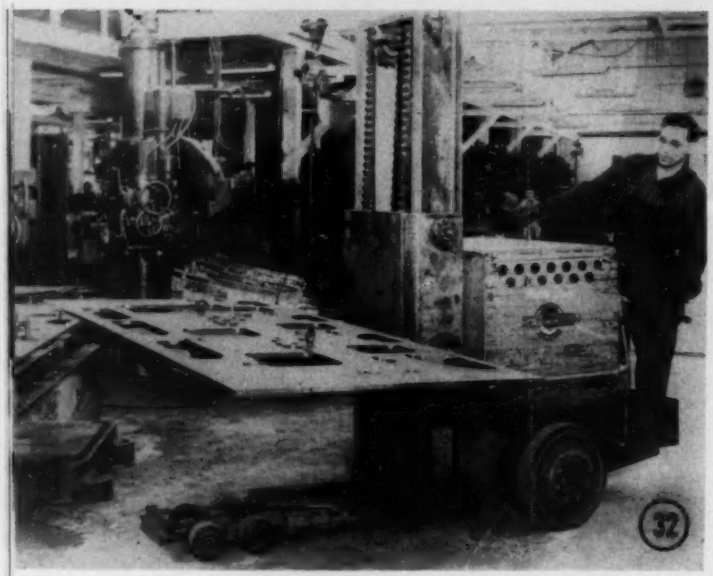

*Fig. 32—High-lift platform truck in a machine shop area. Courtesy Crescent Truck Co.*

other hand make the longer hauls to and from zone or departmental storage.

**Pallets and Skids**—Metal and wooden pallets, skids, platform boxes by which unit loads are handled are available in many styles and capacities to accommodate any type of load which lends itself to this kind of handling. Pallets can be divided into three general groups: Expendable, general purpose and special purpose.[23] Designs include two-way, permitting entry of forks from two sides only, and in opposite directions; four-way and eight-way—forks can enter on all four sides and from the angle of all four corners. The two styles are: Single face, having only one deck as the top surface and double face. The latter style has both top and bottom decks—made in both reversible and nonreversible designs.

Types of wooden pallets: (1) Flush stringer, in which the outside stringers are flush with ends of deck boards; (2) single wing or airplane, with outside stringers set inboard several inches on the top deck; (3) double wing or stevedore—outside stringers are set inboard of both top and bottom deck boards to take care of bar slings for handling the pallet. Some of the standard sizes are: 40 x 32, 42 x 42, 40 x 48, 42 x 48, 36 x 48 and 48 x 48 inches. Weights of wooden pallets vary from 50 to over 100 pounds. Pallet sizes are always designated length before the width. Width is the dimension parallel to the top deck boards.

Metal (steel, aluminum and magnesium) carriers include lift truck skid platforms, bumper channel runners, floor channel runners, platform with flat top sheet, platforms with cut-out legs, stake platform, tiering boxes, tote pans, all-steel or steel and wood pallets with slatted or solid decks, collapsible containers, tote boxes. In addition to these standard carriers, specially designed and constructed containers can be manufactured for any type of job or load.

One variation of the pallet box is a door in the side of the box designed to make materials in a stack more accessible without tearing down the entire stack or disassembling the unit load.[24] This system is applied successfully in stockrooms or in "in process" storage.

Capacity of steel platforms to handle small materials and parts which do not stack solidly, can be increased by using box or stake equipment. When both plain platforms and platform boxes are required, equipment is rendered more flexible by using detachable boxes. Bars, pipe or rods are handled most efficiently using side stakes made of either channel or pipe. When materials are to be stored prior to use, platform boxes equipped with tiering angles make possible the maximum utilization of overhead space.

Testimonials on the advantages of handling loads as composite units are always enthusiastic, especially when dollar-and-cents savings have been calculated. In one plant, sheet metal had been unloaded by hand. The management requested its vendor to ship in palletized units weighing 2500 pounds each. Lifts are now handled by fork truck, tiered 8 feet high in the warehouse as compared with the former 4 feet. Savings in direct labor amount to $20.65 on unloading alone. This saving is duplicated when sheets are transported to the production department.[2]

**Shipping Palletized Loads**—While the benefits to be derived from palletization inside a plant are self-evident, the problems encountered in shipping in palletized loads are considerably more complex. Common practice in one plant consists of loading individual units such as bags, cartons and boxes on pallets which are then moved by industrial truck or crane. Pallet loads are stored, one on top of the other, until material is ready for processing or shipping.

In shipping loads from the producer to the consumer, loading and unloading of individual units can be eliminated by palletizing, but returning the pallets themselves is an additional expense that can run into sizeable proportions. Some processes show enough savings by pay for the shipping expense, but generally, freight rates (both truck and railroad) make shipments on pallets economically impossible.[24] This problem centers about the extra weight on the shipping trip, charged at the same rate as the product, and the cost of the return trip. Distance traveled is important in balancing the costs. Fifty miles is an average figure for the distance beyond which it is almost impossible to make a noticeable saving. Pallet pools, which eliminate the return trip; formation of the product into kind of pallet; expendable pallets; use of sheets having very little volume and weight are some of the means which are being studied to make palletized shipments pay.

Cost analysis of a change to collapsible box pallets in shipping automotive valves from one automotive parts manufacturer shows some substantial savings both to the manufacturer and to his customer.[25] Prior to the introduction of palletized loads, valves were shipped in perishable cartons, weighing 2.5 pounds each and costing $0.295 a piece. Capacity of each carton was 320 valves.

A 225-pound collapsible box pallet, developed in co-operation with the engine builder, holds a unit load of 7776 valves, requires less labor to prepare for shipment and also simplifies the customer's unloading and handling problems, since the pallet serves

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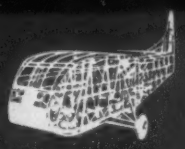

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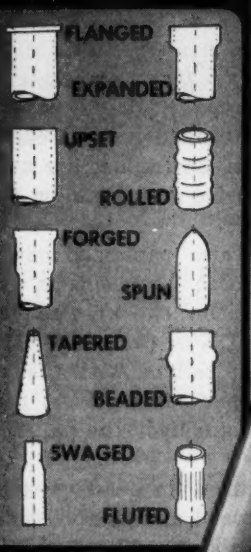

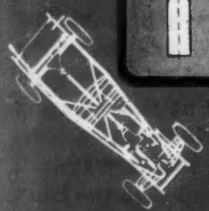

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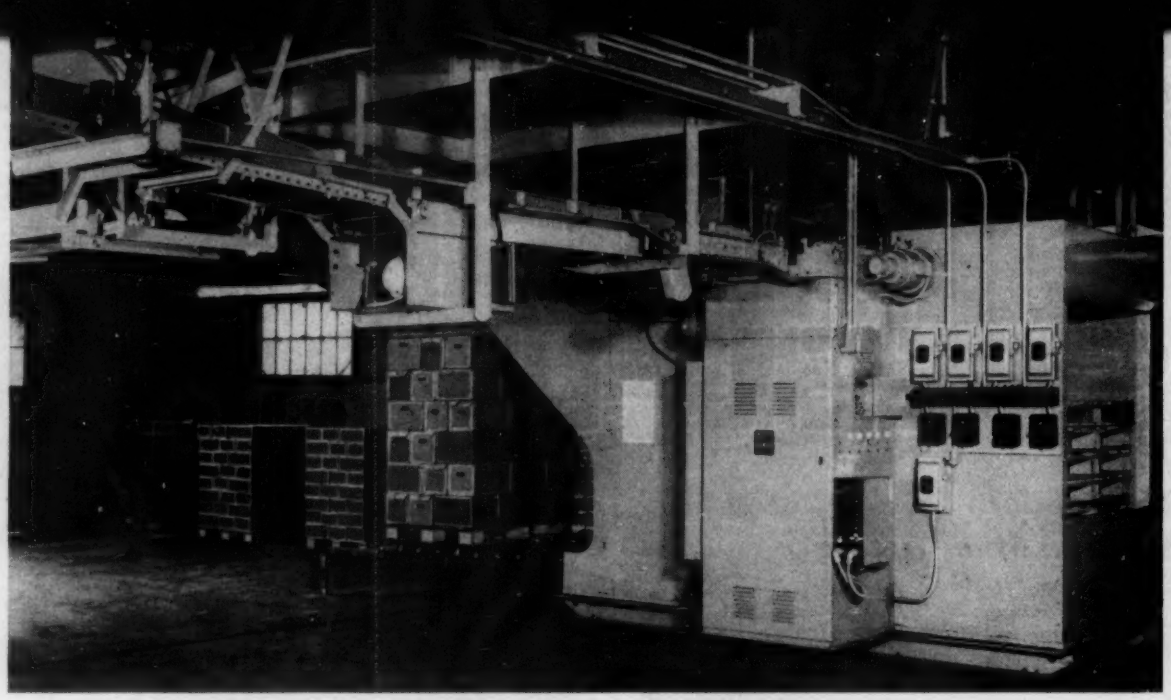

*Fig. 33—Automatic pallet loader used to palletize cartons. Courtesy Lamson Corp.*

as a rack on the production line. Empty boxes are collapsed and returned to the valve supplier at a freight cost of $1.55. The pallet box costs $34.00 and is used for 30 round trips.

Carton cost per 1000 valves was $0.92; pallet cost per 1000 valves, including return freight, is $0.575. Analysis of the accounting charges shows that general indirect labor was reduced from $0.8440 to $0.7130 per standard productive labor hour; general supplies were cut from $2.50 to $1.8750 per standard productive labor hour. The overall result gives a reduction in the burden rate from $7.430 to $6.410 per standard productive labor hour, or a net minimum monthly savings of $1.730 at the normal level of activity of 2146 standard productive labor hours.

Savings at the engine builder's plant are also significant. The slight increase in freight cost of $0.21 per 1000 valves, caused by the greater weight of pallet boxes as compared with the cartons, is absorbed by the customer, because that extra expense is offset many times by the savings effected by pallet load handling.

A so-called "consumable pallet" represents the results of ingenuity at work. Die casting metal is cast in the form of pigs which interlock and form units of self-contained "pallet loads" capable of being handled by lift trucks.

Palletization of interplant shipments of engines, heavy castings and service parts has resulted in less breakage, reduced shipping and receiving time, lower handling costs generally, at one automotive company.[26] Water pump housings, fan drive pulleys and pistons are now shipped in standard pallet boxes 42 inches square, eliminating breakage, reducing rusting. These rough castings were formerly shipped loose on the floors of railroad box cars or highway trailers.

Engines shipped to the company's other works, where they are assembled into finished products, were formerly transported by standing them on end and bolting them to the truck floor. Instead of putting 38 engines on a flat bed truck and using four men to do the loading, the company now loads 52 engines on each truck, using a 4000-pound lift truck. In shipping another engine for a heavier unit, the old method of handling was to hand load 22 engines to each trailer. In 15 minutes, 36 engines are now loaded on a trailer, by using device racks holding three engines each.

Service parts are also palletized now, instead of sending the cartons loose. Crankshafts were formerly packaged and carted on two-wheeled trucks about 100 feet to the dock. New procedure calls for packages to be loaded on pallets, with the number running from 16 to 25 per pallet. From the packaging point, hand lift trucks deliver the palletized loads to the shipping dock.

Extra time consumed in loading and unloading cylinder sleeves cartoned and shipped loose in trucks was the result of double handling in loading and unloading. Sleeves had to be unloaded at the receiving plants, stored and unloaded again. Now, the cartons, with six sleeves each, are placed on a standard 42-inch square pallet, with a top wired or banded to the base. Connecting rods are handled in the same manner, except that a pallet box is used.

**Standardized Containers**—In a plant making automatic washing machines, an analysis was made with the idea of standardizing containers to simplify handling procedures.[1] In the first analysis, covering 99 light metal stampings, it was found that 61 parts arrived loose on the floor of road trucks. Balance of the parts were shipped from vendors in odd-shaped barrels or kegs, stackable and unstackable cartons, wood boxes of assorted sizes and shapes and burlap bags. Often, the same part was received in two or three kinds of containers and with different quantities in each.

A study of the type of material, size, weight, characteristics and sources revealed that the parts could be palletized and handled in unit loads. The plant's

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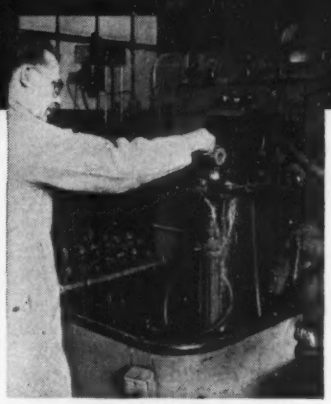

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handling system was extended to cover conditions of this type of operation. Three styles of pallets with basic dimensions 48 x 40 inches, were standardized. For stackable cartons, boxes, drums and other material that would pile or stack into self-supporting units, a plain hard wood double faced pallet, designed for use with a hand pallet truck was recommended. Nonstackable cartons, loose parts or parts in burlap bags are carried in bin type pallets. Largest percentage of parts from outside vendors is now handled in wire mesh containers with pallet base. All the advantages of a box or bin type pallet, and the benefit of knock down sides are available with this type container.

Fewer man hours, better utilization of space, more efficient handling of parts, a minimum of salvage and more effective inventory control were some of the objectives accomplished by standardization.

**Plant Layout**—Pallet systems and trucking equipment are among the essential factors in designing a plant storage layout.[27] After a suitable pallet size has been standardized, load piling patterns, stacking heights should be considered. A ceiling height of from 18 to 20 feet is recommended to take advantage of the high piling possible with palletized loads. Main aisle width and clearance space between pallets should afford sufficient maneuvering distances for industrial trucks. The vehicles themselves have a direct bearing on the plant layout, since width of the working aisles has to be great enough to accommodate the trucks. In addition, doors, pipes and other overhead structures must allow proper clearance for truck masts.

*(To be Continued)*

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## Midland Works

*(Continued from Page 96)*

oils the entire mill. A 52 x 168-foot motor room is equipped to regenerate current for the 4-high mill drive and contains all auxiliary and control equipment.

**Hot Reel Furnaces**—Reels in the Dun-Mar furnaces were made by the Calorizing Co., Pittsburgh, to United order. They each have a single slot and are driven by 150-hp motors. When the strip passes through the rolls, the reel receives the strip end and starts coiling automatically. The overhead furnaces are gas fired to a temperature of 1200 to 2100°F. Small pinch rolls are located on either side of the mill, between the mill and furnaces, to control strip travel. Steam and high-pressure water sprays are employed to remove the scale.

Operations on this mill are about as follows: A strip plate is delivered from the 2-high roughing mill at approximately 0.6 to 1.25 inches thick, and after being front and back end sheared is given one or two passes at the new 4-high reversing finishing mill in the flat form prior to coiling. The strip is then coiled until the end of the strip has left the mill completely, at which time a pair of pinch rolls, located on each side of the mill, is pressed downward on the strip to prevent the tail end of the strip from being coiled and at the same time to start feeding the piece back into the mill to the other coiler. Thus the first coiler now becomes an uncoiler, while the other coiler becomes the winding coiler. The mill and auxiliary equipment are reversed for every pass.

This operation is continued until the final strip thickness is obtained, at which time the strip is conveyed down the runout table to the final mandrel-type coiler, where it is coiled and discharged on a coil conveyor for cooling and transferring to the coil storage building. In event the final strip is required in flat form it will not be coiled but will be delivered to the finishing shears to be cut to the required lengths.

Near the end of the hot line is a United 60-inch, hot strip upcoiler. This design saves space and is more accessible for maintenance and more exposed to the operator than the usual down-coiler. A bypass permits plate to continue to the 60-inch upcut plate shear.

A 25,000-pound capacity upender is installed at the upcoiler to handle coils. Coils are weighed on a Fairbanks-Morse 2-section mill scale of 40,000 and 60,000 pound capacities.

Conveyor with double strand 12-inch pitch chains handles coils up to 56-inch O.D. by 30-inch I.D. and 50 inches long from the mill building to the storage building. A hydraulic turntable with rotating pallet 58 inches diameter by 77 inches long directs the flow of coils at right angles or as directed. A slitter and roller leveler for plates and sheet bar completes the hot rolling mill line.

A trancept building at the end of the hot mill is divided into a storage area of 29,000 square feet, for steel in process, and an annealing furnace area.

The sheet annealing furnaces consist of four bases and two hoods with 22½ foot x 8 foot 2 inch rectangular chambers. Coil annealing furnaces are of the bell type and consist of five bases and two hoods 5½ feet x 9 feet 7 inches.

The new Midland annealing and pickling lines for stainless and specialty steels incorporate the latest process details which have been

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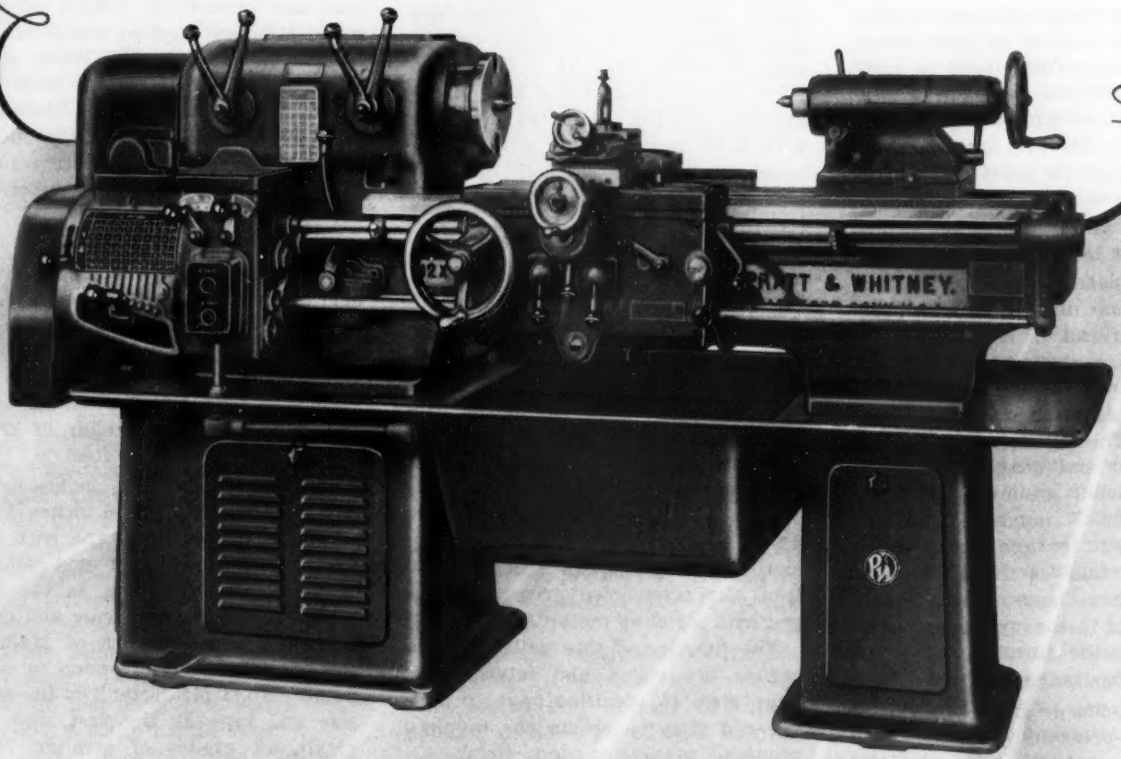


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evolved to meet the problems of handling alloy steels.

At the entrance of the line is an uncoiler and leveler which uncoils, flattens and feeds the hot rolled strip. The hydraulically-controlled uncoiler and coil lift can handle coils up to 60 inches diameter. A 60-inch upcut hydraulic shear squares strip ends before welding.

Butt or lap welding of the strip, to permit continuous annealing and pickling, is performed by a 13 x 22-foot welding car equipped with a 600-amp dc Heliarc welding machine and fabricated by United Engineering & Foundry Co., Pittsburgh. Positioning and holding clamps are hydraulically operated and are capable of handling strip from 20 to 54 inches wide with gages from 0.050 to 0.187 inch. To maintain continuous feed and allow for welding time, a 5 foot 4 inch wide, 70 foot long, 10 foot deep looping pit is located ahead of the welding car.

A tension wiper is located at the entrance end of the annealing furnace to regulate tension and prevent the strip from dragging in the furnace. The furnace, 10½ feet wide and 52 feet 8 inches long, is fired with coke oven or natural gas. It has a 5000 cfm fan driven by a 30 hp motor. The furnace will continuously anneal and quench hot rolled chromium-nickel grades of stainless steel at 2200° F maximum. It can be by-passed for pickling chrome grades of stainless steel. Support rolls 10 inches diameter and 58-inch face are used to convey strip in process between the furnace and pickle and water dip tanks.

At the discharge end of the pickle line, a high-pressure water spray removes loose scale from the strip. A hot water rinse tank cleans and maintains proper temperature of strip prior to drying. A 30 hp hot air blower drys the strip as it comes from the hot water rinse tank.

Pinch rolls, 12 x 60 inches, of forged steel, feed the strip from the dryer to the shear, tension rolls, and coiler. The shear is a 60-inch upcut, hydraulically operated. Welds are sheared out of the strip and test samples are taken at the shear. Rolls with side guides and drag tension feed the strip to the coiler and maintain proper tension for coiling. The coiler has a wedge-type expanding mandrel with a hydraulically-operated coil lift and traversing coil stripper car.

Cold rolling department possesses what is believed to be the first tandem cold rolling mill built for stainless steel. The traversing uncoiler for the cold mill has a 60-inch face and wedge-type expanding mandrel and hydraulic coil lift. The mandrel will expand from 17 to 21 inches and maintain back tension for rolling.

Stand No. 1 is a United, 4-high mill with 53 x 54-inch backup rolls and 16½ x 56-inch work rolls. The mill drive is direct-connected to a 1500 hp motor. The screwdown drive is 100 hp. Speed of the first stand is 641 fpm maximum.

Stands Nos. 2 and 3 have the same size work and backup rolls and horsepowers. Their only variance from No. 1 mill is in maximum roll speed. No. 2 stand has a speed of 780 fpm maximum and No. 3 a maximum speed of 880 fpm. This mill will cold reduce hot rolled and intermediate gage coils down to 0.018-inch or any gage in widths from 18 to 50 inches.

The tandem mill coiler has an expanding mandrel 20 inches diameter with a 56-inch face. It also has an hydraulically-operated coil lift and traversing coil stripper car. The coiler is driven by a 600-hp electric motor. A belt wrapper is operated in conjunction with the coiler to start light-gage coils without delay.

To feed strip to the 56-inch reversing cold reduction mill, an uncoiler and feeder identical to the tandem feeder has been installed. The mill is a United 4-high reversing cold mill with 53-inch diameter by 54-inch face backup rolls and 16½-inch diameter by 56-inch face work rolls. The mill is direct driven by a 2000-hp motor at a maximum speed of 850 fpm. Its screwdown drive is equipped with a 100-hp motor.

The function of this mill is to cold reduce hot rolled and intermediate gage strip to specified gage to temper roll strip to obtain the required physical properties and finish.

The 26-inch reversing cold mill has an uncoiler and feeder with a 16 to 22-inch expanding mandrel with a 26-inch face and a cloth roll feeder. It is provided to uncoil and feed strip with proper back tension.

The mill is a United 4-high reversing unit with 33 x 26-inch backup rolls and is driven by an 800-hp motor at a maximum speed of 800 fpm. The work rolls are 12½ x 26 inches and the screwdown drives are powered by two 13-hp motors.

The skin pass mill is a 2-high single stand unit with 25 x 26-inch rolls. It is driven by a 100-hp motor at a maximum speed of 200 fpm.

Entrance end of the No. 2 cold rolled stainless annealing and pickling line is equipped with two small and two large uncoilers, each possessing a hydraulically-operated expanding mandrel. Air-operated lift, 8 inches diameter by 60-inch face pinch rolls, cloth covered, are fitted in the line to feed strip to the welding car. The annealing and pickling line will process stainless strip at a speed of 10 to 150 fpm.

A smaller welding car, 13 x 18 feet, is employed in this line than was in No. 1 line. The car is virtually identical to the No. 1 automatic Heliarc welder but uses 400 amp dc, and is not used for buttwelding.

The looping pit, to maintain continuous operation, is also slightly smaller than the pit in No. 1 line. Tension wipers at the end of the looping pit prevent the strip from dragging in the furnace.

The furnace will continuously anneal and quench all grades of cold rolled stainless steel at temperatures from 1300 to 2150° F. When pickling only is required, the strip bypasses over the furnace. Asbestos and cloth support rolls at the end of the furnace convey the strip to a water dip tank to cool it before it enters the pickling acid.

The No. 1 pickling tank is of rubber covered steel construction with acid brick lining for electrolytic pickling; its dimensions are 7 feet 2 inches by 26 feet 8 inches by 3 feet deep. It will pickle straight chromium grades of cold rolled stainless steel and will pickle all grades of chromium-nickel stainless steel.

The No. 2 tank, (7½ inches by 48 feet 8 inches by 3 feet 6 inches deep) a rubber covered steel tank with carbon brick lining for hot acid pickling is about twice as long as the first tank. It will remove scale and clean chromium-nickel grades of stainless steel for further conversion or shipment. No. 3 pickle tank is the same size and type as the first, and will pickle all grades of straight chromium stainless steel where a high luster is desired, as well as chromium-nickel grades.

The acid fume exhaust system, acid storage and acid disposal are all of the same design as used in the No. 1 line. A scrubber with four rotary brushes is located at the end of the pickle tanks to remove loose scale. Hot water rinsing tanks and hot air drier are of the same design as used in the first pickle line. Master pinch rolls of rubber covered steel regulate the speed of the line, pulling the strip through and feeding it into the delivery looping pit. The pit has an automatic loop control. Guides and tension wipers maintain tension for coiling as the strip is fed from the looping pit through additional pinch rolls to the coiler. Shears at the coiler have one 30-inch knife and one 60-inch knife, of upcut design, hydraulically operated. The coiler, with reel and stripper, is of

the same design as that of the coiler at the end of the number one line.

No. 3 cold rolled stainless annealing and pickling line is for heavy as well as light gages. The feeding end of this line has a 2-mandrel-type uncoiler for light-gage material, and a cone-type uncoiler with a 7-roll feeder for heavy-gage material. A 60-inch shear is included to shear strip for welding.

The Heliarc welding car is a duplicate of the same unit in the No. 1 line. The looping pit has the same dimensions as previous pits, except that it is 62 feet long. A wiper at the end of the looping pit maintains the proper tension on the strip so it will not drag in the furnace.

The furnace, 10 x 52 feet, is fired with coke oven or natural gas to continuous-anneal and quench all grades of cold rolled stainless steel at temperatures from 1300 to 2150° F. Asbestos and cloth support rolls at the end of the furnace convey strip to a cooling water dip tank. When pickling only is required, the strip by-passes the furnace.

Three pickling tanks, two 26 feet 8 inches long and one 48 feet 8 inches long, are of rubber covered steel construction. Two are lined with acid brick for electrolytic pickling, and one with carbon brick for hot acid pickling. The electrolytic type will clean, descale and give luster to straight chromium stainless steel, and all will process chromium-nickel grades of stainless steel strip. A high-pressure water spray unit is included to remove loose scale from heavy-gage strip. A 2-brush rotary scrubber removes scale from light-gage strip. Drying facilities consist of a 16 foot long hot water rinse tank and a 60-hp hot air blower.

A 60-inch downcut shear, hydraulically operated is included to shear heavy-gage coils, remove welds and secure test samples.

To guide and regulate the tension of both light and heavy-gage strip, a heavy-gage tension machine and light-gage tension rolls have been installed. The coiler at the end of this line is of the same type as previously described coilers, with a mandrel 20-inch diameter and 56-inch face.

A 54-inch multiple slitting line is located in the No. 2 trancept building at the end of the No. 3 stainless annealing and pickling line. The feeding end of the line is equipped with an uncoiler and leveler, a 60-inch shear and electrically-operated roller-type strip guide unit.

A 5-roll drag tension unit maintains proper tension for coiling and a 20-inch diameter by 56-inch face coiler receives the product. A scrap winder prepares the proper size and type scrap package for electric furnace charging.

No. 1 welding, inspection and surface conditioning line is equipped with a 7-roll feeder, hydraulically-operated cone or flange type uncoiler and leveler for feeding and flattening heavy-gage products. The shear is a 60-inch hydraulically-operated upcut to shear coils, and secure test samples. The welding jig employs a 400 ampere dc Heliarc welder for coil buttwelding. A 5-roll tension unit is provided for coiling. The coiler has a 20-inch diameter by 56-inch face mandrel with hydraulically-operated coil lift. Any defects found in heavy-gage coils are ground out on this line, on which inspection also is carried through.

The feeding equipment on the No. 3 welding, inspection and surface conditioning line consists of an expanding mandrel payoff reel, hydraulic coil lift and 8-inch diameter cloth pinch rolls for feeding strip into the line. The shear is a 60-inch hydraulically-operated upcut unit. Tension wipers maintain tension for coiling on a 20-inch diameter by 60-inch face, with a hydraulic coil lift and traversing coil stripper car.

Both conditioning lines are equipped with high-cycle grinders for surface grinding.

The finishing and shipping department is located in a spacious building at the end of the cold rolling line. This department is fully equipped with light and heavy-gage shearing and slitting equipment, levelers, conveyors, flying shear line and loading equipment.

The No. 3 multiple slitting line is installed to side trim strip from 12 to 52 inches wide or slit multiple strands from 4 to 25 inches wide in thicknesses for 0.015 to 0.078-inch. It is equipped with a payoff reel and pinch roll to feed strip to the line. An entry looping pit maintains proper loop on light-gage products by means of an electric eye control like that of the heavy-gage shear line.

The rotary slitter has 10-inch diameter knives and an arbor 5½ inches diameter by 57 inches wide. An exit looping pit, also fitted with an electric eye, maintains proper loop of sheared materials. A coiler, with reel and stripper, is fed strip by rubber covered tension rolls, and coils it on a 20 by 60-inch wedge-type expanding mandrel. It also has an hydraulically-operated coil lift and traversing coil stripper car.

This slitter line is followed by scrap shears, downcut and re-squaring shears. Two levelers are included in this department. A combination side trimmer and flying shear line and multiple slitting line complete the roster of principal equipment.

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## Weld Failures

(*Continued from Page* 93)

usual methods of inspection. Attention is therefore directed entirely to the control of quality of the welded joints. Of principal interest is the strength, ductility, and appearance of the weld and on these factors, quality is judged.

Necessity for maintaining the appearance of the weld is obvious. This factor is controlled by measuring the tip indentation of spot welds, and by comparing with visual standards. Fig. 2 shows an appearance standard chart, illustrating the maximum worn tip diameter for different thicknesses of steel.

Strength of the weld is essential, since the structure's design is based on the established minimum weld-strength. Ductility of the weld is also important since it is an indication of its resistance to shock and fatigue strength. No method has been found to determine ultimate strength and ductility of a weld except by a destructive test. Since it is not practical to test production parts to destruction, test specimens are used which are identical in quality and thickness to the regular production parts, but of a size suitable for testing.

It was found that the most satisfactory method of determining the quality of spot welds on heavy steels (⅛-inch thick and over) was torsional testing which gives a simple and accurate means of determining weld strength and ductility, since strength is proportional to ultimate torque and weld diameter (which is easily measured). The ductility is proportional to the angle of twist.

**Weld Quality Index** — Angle of twist, torque, and diameter for a weld of a given thickness of material, when properly aligned on the weld quality evaluator, as shown in Fig. 5, will give an indication of the stress, shear strength, and quality control number of that weld. Thus, the weld quality index represents a combination of the three factors which govern the strength and quality of the weld. These factors are torsional strength (torque), diameter of the weld nugget, and ductility of

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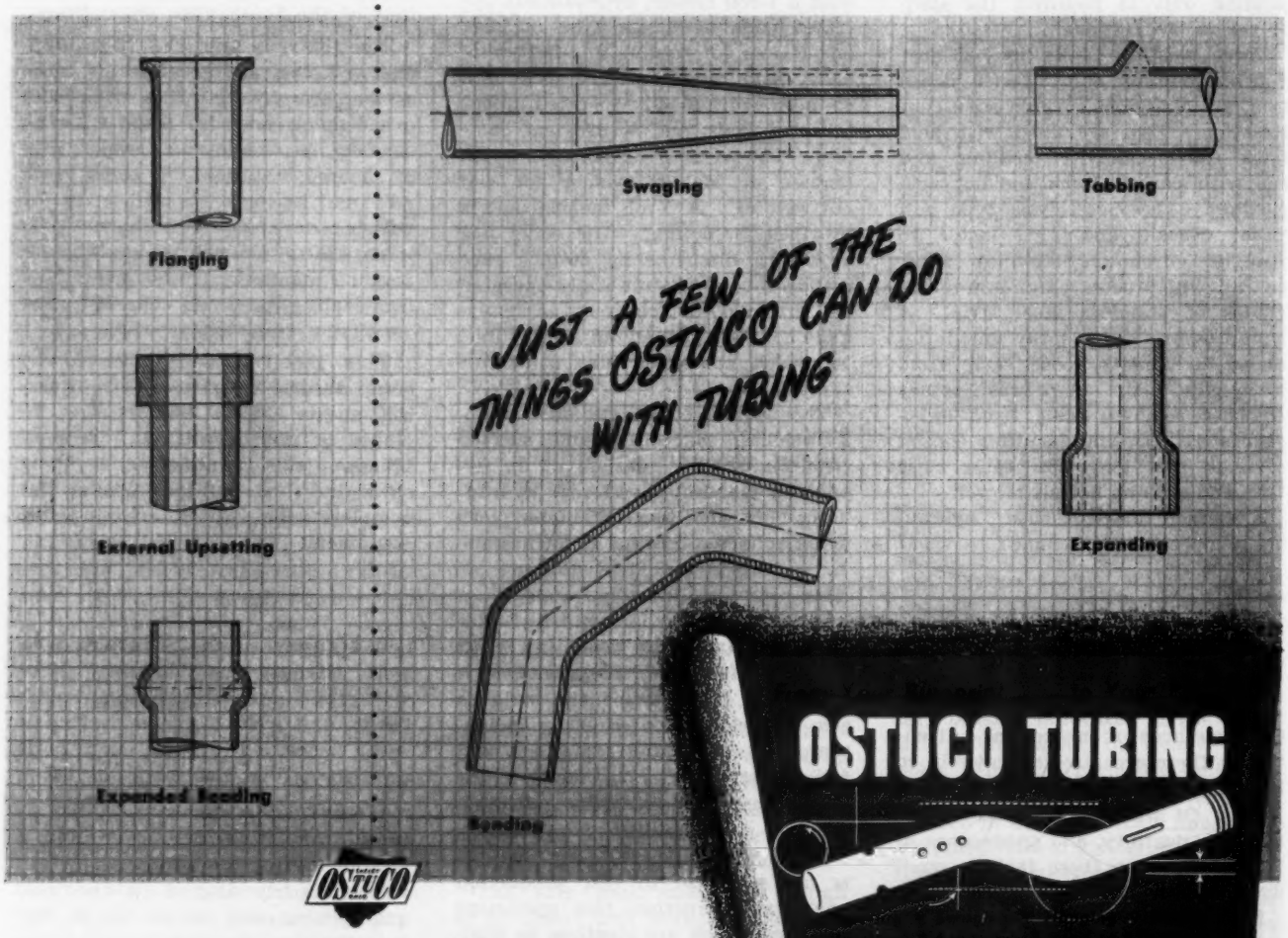


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the weld material. From the static strength standpoint, only torque and weld diameter need be considered, in which case there would be little difference between a small, strong weld and a large weld with poor weld metal. Thus, ductility of the weld is an indication of the quality of the weld metal and its ability to resist failure under shock load conditions.

Since the point of chief concern is the straight shear strength of the weld, the modulus of rupture in torsion is calculated, and then converted by formula to straight shear strength. It has been determined from laboratory tests that the straight shear strength is approximately equal to twice the torque divided by the diameter of the weld. The straight shear value, multiplied by the angle of twist, gives an index of weld quality which is then converted into a quality control number by dividing this product by 1.5 times the minimum straight shear strength to bring the quality control number representing the minimum design requirements for each thickness of material to a common control base of ten. The circular calculator shown in Fig. 5, was developed to complete these calculations rapidly and with a minimum chance of error. Thus, having standardized welding procedures available and properly calibrated welding machines, and a means of measuring the quality of one weld compared to another, it is possible to apply statistical quality control techniques to the processes involved.

**Control Chart Method**—The speaker, in continuing the discussion of quality control methods, stated that the control chart method as covered by American Standards Association publications Z1.1, Z1.2 and Z1.3) was adopted, using a chart for averages (X) with a modified range (R) chart. After a few weeks of trial testing, during which the process was checked for control by a study of the frequency distribution charts on data collected, it was found that a sample lot of three would be adequate for control of this process. A frequency distribution was then made for each type and thickness of material. These distributions were found to have too large a spread indicating a lack of control. A study of the records indicated that a wide variation in machine settings was being used; therefore, correlation charts were made which showed that the closer the settings were to the standard, the better the weld quality. At this point, these correlation charts helped to dispel any doubts in the minds of the operators concerning the recommended settings.

Since satisfactory control limits could not be established from the original distributions, different distributions were made using only that data obtained from welds produced by the use of recommended settings. These distributions made on each type and thickness of material showed that a state of control existed when the recommended standard machine settings were used. It also, showed that five different sets of control limits would be required depending upon the steel's weldability.

It was impractical to use five control charts on each machine or have five sets of control limits on each control chart. Therefore, control chart scales were developed for each grade of steel to plot weld-quality on the control chart. Thus, it can be seen that one set of control limits was common for all grades of steel. From the practical standpoint, shop personnel became confused when discussing control limits because they had to associate the different weld-quality numbers that correspond to the control limits for each grade of steel. In order to eliminate this confusion a system of "process control numbers" common to all steels was used for plotting the data. This was done by means of a table which readily converted the weld quality numbers to "process control numbers". These numbers were indicative of weld quality with respect to the control limits irrespective of the grade of steel being welded. Later on the process control numbers were incorporated on the weld quality evaluators so that they could be read directly for each weld, thus eliminating conversion tables.

**Control Testing**—Weld test specimens are made from drop-off pieces of materials being currently used, a supply of which is kept in suitable containers in welding areas. In control testing, a test is taken on each welder in operation once each hour. Three samples of the same combination of materials and thickness are welded under the same conditions of machine control setting being used on production work at time of test.

Samples are then taken to the testing machines which are conveniently located in the welding area. Some kind of control was required on the testing machine; this was done by using specimens machined from cold-rolled steel bar stock to resemble a welded sample with a ½-inch diameter weld. It was found that these specimens could be tested in torsion to destruction and give uniform results. Five specimens were tested each morning and results posted on a control chart located on the test machines. Results obtained from the test are recorded on the daily record sheet together with the operator's name, type of material, and welding procedure. It was pointed out that these record sheets become a permanent record of performance in the welding sections. On the right side of the record sheet is a chart showing the plotted points with respect to the control limits. Every morning the previous day's record sheets are forwarded to the central control office for analysis. Here also, the results are transferred to a weekly record sheet for distribution to department heads.

Control charts are placed on each machine and results are plotted immediately after each test. A record sheet is filled in by the control operator and becomes a permanent record of performance in the welding sections. According to schedule, these charts are forwarded to the foreman's office the following morning. The foreman reviews the charts and depending upon the performance shown, may call into his office certain machine operators or may call a maintenance man to have a machine checked.

This method of controlling weld quality has given excellent results. Proof tests on welded structures made under controlled conditions have proved the effectiveness of the control. Special test structures have been made and subjected to severe shock conditions without any weld failures. Resistance welding, properly controlled, is a safe, dependable, fabrication process and quality control of this metal working process can insure strong, dependable welds of uniform high quality. In addition, the application of quality control methods to resistance welding offers the following additional advantages: It maintains a continuous check on spot welding operations, which keeps the operators constantly aware of the importance of following recommended welding practice and develops a competitive spirit between welding groups. It quickly detects erratic machine performance, and gives the foreman prompt warning of needed maintenance which is always essential to good overall performance. Changes in the level of weld quality due to any radical difference in the weldability of lots of steel is quickly indicated. Design practices which do not contribute to good quality welds, such as insufficient overlap, lack of clearance for electrodes, and conditions requiring specially shaped electrodes and arms, are quickly identified.

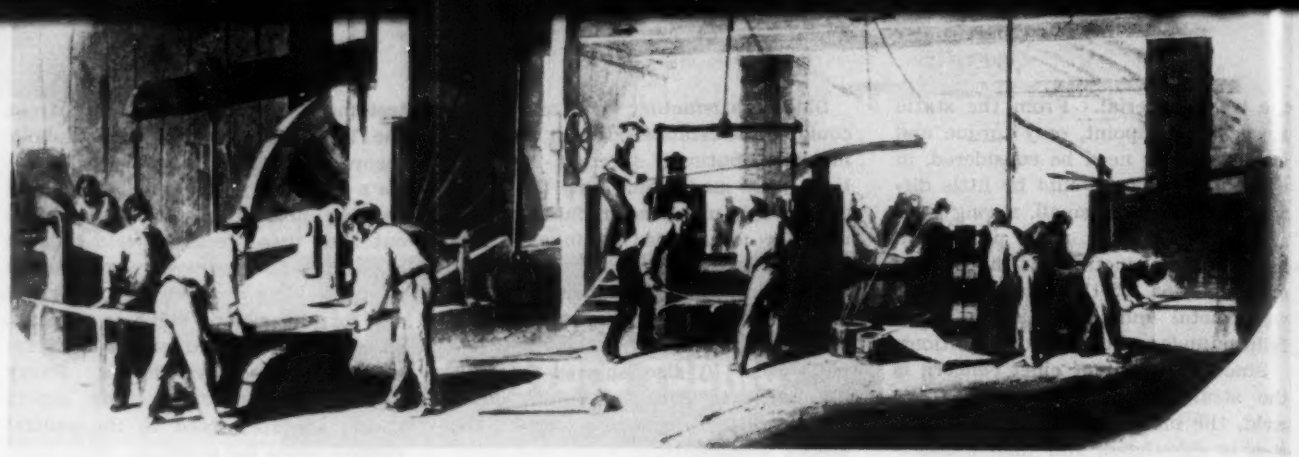


*Fig. 1—Old Lukens mill of the early nineteenth century showing rolling and slitting*

**FUNDAMENTALS of STEELMAKING**

**NUMBER 8 OF SERIES**

**Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.**

# PRODUCTION OF PLATES

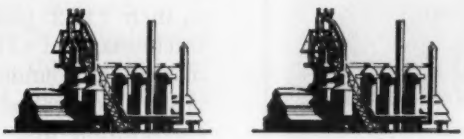
*"Sired" by Isaac Pennock, during the latter part of the 18th century, the development of iron making was particularly active in Pennsylvania. Early plates were hammered from charcoal iron blooms by tilt hammers operated by water wheel power or by the more laborious process of hand sledging*

By W. LOUIS BUNTING
*Superintendent of Plate Mills*
Lukens Steel Co.
Coatesville, Pa.

THE oldest iron and steel plate producer in America is believed to be what is now known as Lukens Steel Co. in Coatesville, Pa. The business had its inception in about 1793 when Isaac Pennock, a farmer of Chester County, Pa., established an iron slitting mill at Rokeby about 4 miles south of the present location of the Lukens mills. Charcoal iron slabs were heated in an open charcoal fire, rolled out into plates and then slit into rods for general blacksmith use. Slabs were obtained from charcoal bloomeries in the nearby valleys. In 1810, Isaac Pennock and a partner, Jesse Kersey, acquired another mill property on the Brandywine creek at Coatesville, which is now the site of the Lukens plant. The first boiler plate in America is said to have been produced on this mill.

The earliest plate mill had rolls 16 to 18 inches in diameter, 3 to 4 feet long, and used charcoal iron blooms, reheated over a grate fire, for rolling of boiler plate. At that time, plates wider than about 34 inches were almost impossible to roll. However, as iron was gradually replaced by steel, as boilers and pressure vessels came into use, there was a never-ending demand for wider and thicker plate. Mills sprang up throughout the country. With the growth in business, and the necessity for more power, improvements were made in equipment and larger rolls

*Fig. 2—Battery of heat treating furnaces. Note flame cutting of heavy plate being performed in lower right of photo*



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# Production of Plates

**A native of Chester county, W. Louis Bunting was born in Parkersburg, Pa., Feb. 7, 1894. He attended the public schools of Lancaster, Pa. and started with Lukens Steel Co. as a furnace recorder in October, 1909. Three years later he become clerk in the mill order department. Subsequently he worked as pit crane man, pit helper, roll straightener, hook-up man, table man, screw man, millwright and roller foreman. On Oct. 26, 1935 he was made assistant superintendent of plate mills. Two years later he became superintendent of the 140-206-inch mills. In November, 1942 he was appointed superintendent of plate mills, the position he now holds.**

were installed.

In 1918, at Lukens a mill was built which was then, as now, the world's largest plate mill. Some scoffed at the idea of such a large mill, refusing to co-operate in designing and building such a "visionary, impractical unit". But Lukens went ahead and built a mill capable of rolling plates up to 195 inches and even wider by special arrangement; also plates up to 25 inches thick. Today, without the facilities of this mill, one-piece locomotive crown and side sheets would be impossible, some of the most modern oil stills could not have been constructed in their present sizes, pressure vessel design would be years behind its present advancement, and many other industrial equipment developments would not have taken place.

With installation of mills producing wider and thicker plate, impetus has been given to the development of various "qualities" of steel plate with diversified industrial applications. Progress in machine flanging, forming, flame-cutting and welding have brought new and greater possibilities for steel plate plus the development of steel plates with physical properties for special uses. Today, industry is availing itself of plates of special quality and alloy steels; also specialties, such as plates "clad" with nickel alloys and stainless metals, for building process vessels and other equipment to resist corrosion and protect product purity with economy of cost.

Under the uniform classification, by size, of flat rolled carbon steel, adopted Sept. 20, 1933, plates are defined as follows: (1) over 6 inches in width and ¼-inch (10.2 pounds per square foot) or over in thickness, and (2) over 48 inches in width and 3/16-inch (7.65 pounds per square foot) or over in thickness. Hot rolled plates are classified according to composition and grades and also according to the kind of mill on which they are rolled.

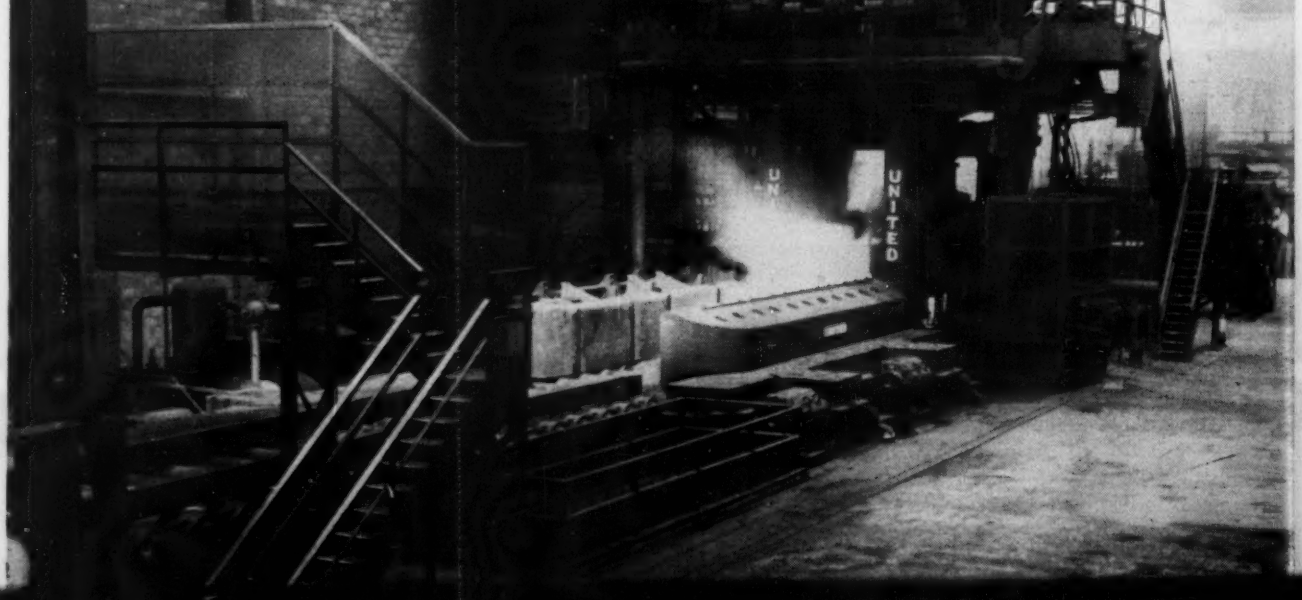
Plates are produced by hot working, which reduces thickness and improves mechanical properties. Whereas, rolling hammering or pressing may be used, as far as tonnage is concerned, the faster and more economical method is rolling which produces plates of uniform section in long lengths.

Steel plates are usually produced from ingots and slabs by rolling on a mill, after first heating the mass throughout to a uniform temperature of about 2300° F in huge furnaces called soaking pits, so named because an ingot "soaks up" heat to make it soft enough to be worked—much as a smithy used to heat horseshoes prior to forging on his anvil.

Heated by gas or oil, soaking pits are open at the top and are built to contain, in an upright position, four or more ingots per pit, depending on their size. They are located adjacent to the entering side of the rolling mill and are serviced by cranes which charge the ingots in and out of the pits to transfer them to the rolling mill.

A steel ingot, which is a product of the open hearth, bessemer or electric furnace, yields about 75 per cent of finished or semifinished product per ton of ingot. The 25 per cent of scrap resulting from discards from ingots and plates is remelted, being continuously in circulation.

*Fig. 3—General view of 45 x 80-inch universal slabbing mill in Homestead plant of Carnegie-Illinois Steel Corp.*

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# Production of Plates

In rolling, the hot plastic steel is passed between two horizontal rolls revolving at the same peripheral speed but in opposite directions. Each entry through the rolls is called a "pass". Rolls are mounted in housings, or stands, and held in position by huge screws. As plate thickness is reduced, physical properties are improved and a finer grain obtained.

A stand having two horizontal rolls is designated as a two-high. A three-high has three rolls, one above the other. Top and bottom rolls are of the same size, both power-driven and always traveling in the same direction. Between the two is a third roll, of smaller diameter, which is alternately raised and lowered to work with the top or bottom roll. The steel is passed between the lower and middle roll and returned between the upper and the middle roll. Tilting tables at each end lift or lower the steel into the passes. A four-high mill has four rolls. Four-high mills are really a special type of two-high mill in which large backing rolls are employed to reinforce the smaller working rolls. The two-high mill is now somewhat obsolete for rolling plates while the four-high mill is the most modern arrangement.

Mills equipped with vertical rolls also, to roll the metal on all sides, are known as universal mills. Universal mills, for slabs or plates, are generally of the reversing type, and are usually equipped with four vertical rolls placed at each end of the two horizontal rolls, two in front and two in back, thus imparting straight parallel edges.

In all rolling mills, the distance between the two working rolls is so spaced to be less than the height of the section entering them. The rolls grip the metal and deliver it, reduced in section, increased in length, and with a slight lateral reduction of the piece. Needless to say, operators of rolling mills must be experienced craftsmen.

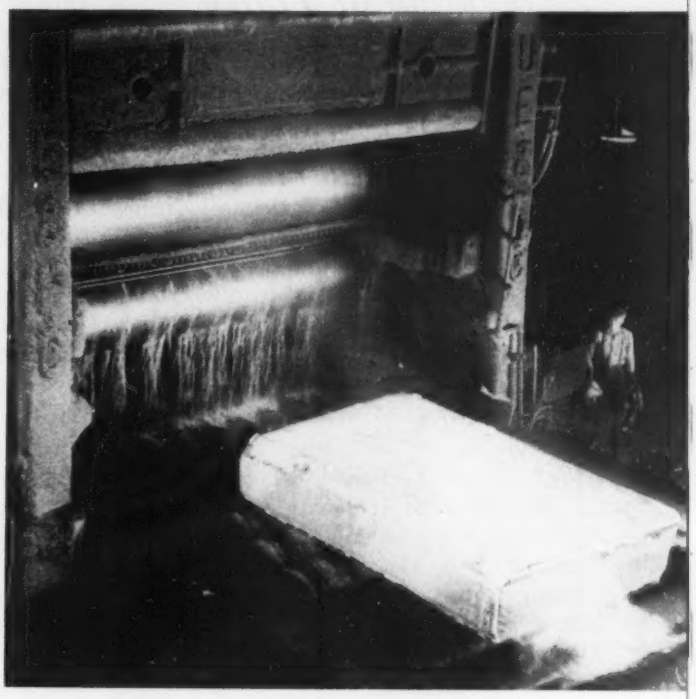

*Fig. 4—Rolling a huge slab on the 206-inch mill at Lukens Steel Co. which regularly rolls plates up to 195 inches in width. Steel has been rolled on this unit from ingots weighing up to 111,000 pounds and, in rectangular patterns, up to 199 inches in width. Plates have also been rolled that have been cut into circles having 202-inch diameters. Plate thickness can be varied up to 25 inches. After rolling, material passes through a set of straightening rolls to impart a flat even surface*

In some mills the direction of roll rotation remains constant. In others, the so-called reversing mills, the direction is changed between passes. In such a mill the steel travels back and forth, the distance separating the rolls decreasing between each pass until the steel is reduced to the desired thickness.

Right here a word should be said about the rolls, the tools that work the metal into plates. Rolls are the chief tools of a rolling mill. The working rolls combine science and art achieved through long years of research and development. The art has covered the experimental use of almost every alloying ele-

*Fig. 5—Turning an ingot at right angles to its previous direction of rolling and rolling it to width, allowing sufficient metal on each side of the required pattern for side shearing. It is then reversed to the original direction of rolling and operation continued until plate has reached required gage and length. A plate so formed is said to be "cross-rolled". Operation is being performed on 206-inch mill*

ment known to have a beneficial effect on iron and steel. Rolls need strength, resistance to wear, and hardness. The selection of the right roll is very important. Recent scientific developments have greatly aided the roll designer and engineer. Coupled with improvements in the mills themselves, improved rolls have been responsible for greatly increased production. Five general types of rolls are in use today: plain cast iron, alloyed cast iron, carbon steel, alloyed steel and compounded rolls. The majority of rolls are cast, but some steel rolls are forged. Rolls vary from 12 to 206 inches in length and from 7 to 54 inches in diameter. At intervals they must be removed from the mills for regrinding.

Tandem mills consist of a series of stands arranged in line and connected with roller tables for shifting the steel from one stand to the next. The first few stands, where the main reduction takes place, are usually referred to as "roughing" stands, while the last group of stands is known as "finishing" stands. Occasionally a set of intermediate stands is used between the roughing and finishing stands. Individual stands may be two-high, four-high, reversing or non-reversing.

Blooming and slabbing mills are the most powerful mills used in hot rolling steel. They may be two-high, continuous or reversing, or three-high. After an ingot has been rolled into a bloom or slab of the desired cross-section it is cropped at both ends to remove segregations or impurities as well as other imperfections which are always found in the top and bottom of an ingot. After cropping, the remainder is cut into blooms or slabs of the desired length for rolling into plates.

In some cases, ingots are rolled directly to the finished plates in a single operation without intermediate heating. Also, in a single-stand mill, the general practice is to enter ingots in the longitudinal direction for the first or rough breakdown pass. It is then turned 90 degrees and rolled until the ordered width of the final pass is obtained. The slab is then turned back to its original direction and rolling is continued until the desired finished plate thickness is reached. However, in most cases, heated ingots are first rolled in special or breakdown mills to reduce sections before they go to the finishing mills.

An appreciable tonnage of plate, both rolled-edge and sheared-edge, is currently being produced on continuous strip mills in addition to strip and sheets. A hot slab of steel is discharged from a heating furnace, passes through a series, or "train", of roughing stands, gathers speed as it travels through the finishing stands and about 2 minutes later is finished into a plate. The raw material for the continuous strip mill consists of slabs produced on a slabbing mill. Prior to rolling, slabs are carefully inspected and all surface defects removed. They are then brought to rolling temperature in a continuous gas-fired heating furnace, usually equipped with automatic temperature control. As needed, a heated slab is pushed out of the furnace to a roller line and carried to the first stand of the roughing train which usually consists

*ACKNOWLEDGEMENT*

*The author wishes to thank the United States Steel Corp. and the Bethlehem Steel Co. for their assistance in the preparation of his manuscript*

*Fig. 6—View of delivery end of the four-high finishing stands of the semi-continuous 100-inch plate mill at Homestead works of Carnegie-Illinois Steel Corp.*

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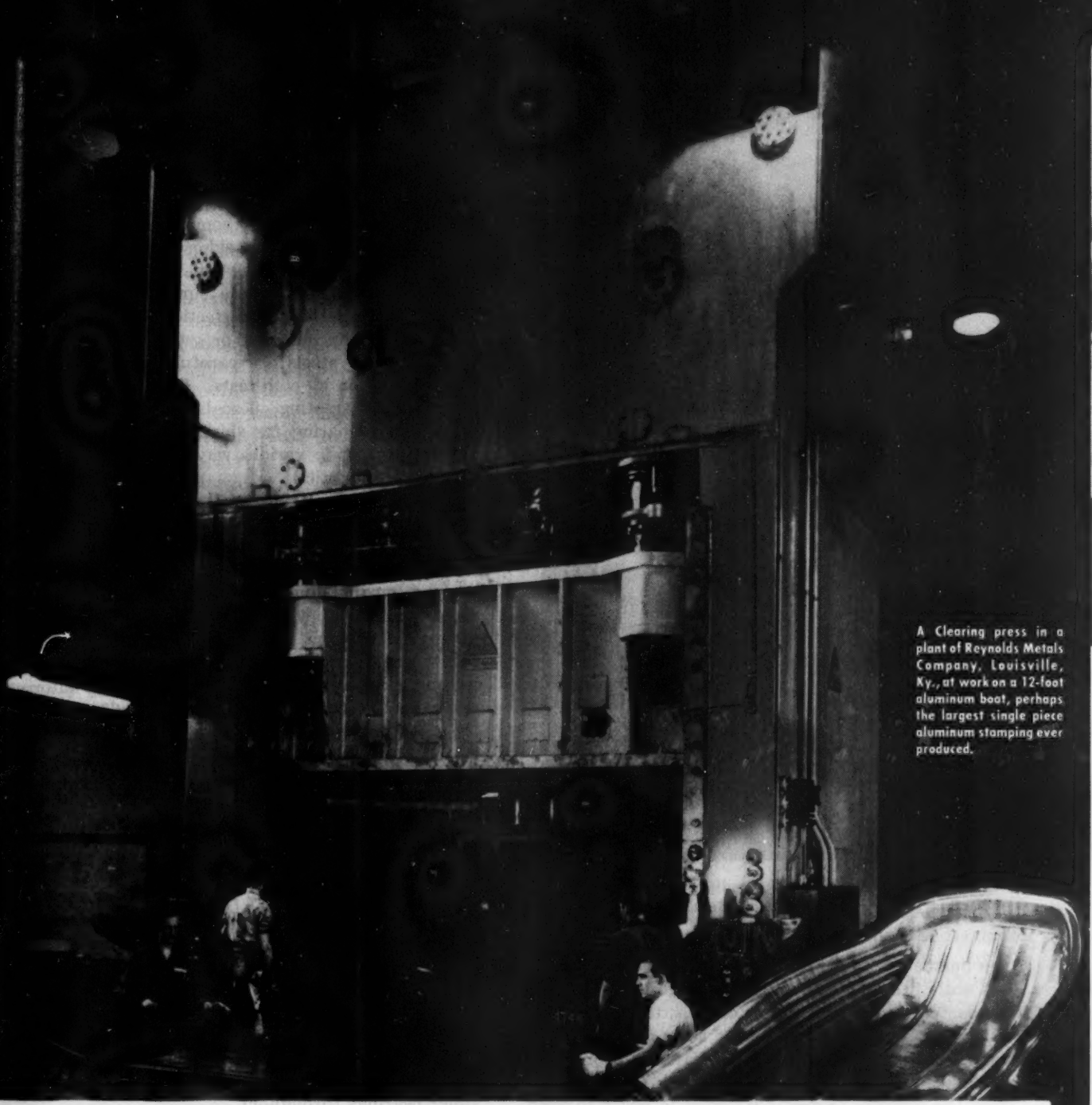

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*Fig. 7—Rolling a slab on the 40-inch slabbing mill at Sparrows Point plant of Bethlehem Steel Co.*

of a number of four-high stands arranged in tandem.

A scale breaker is generally located ahead of these stands. This consists of a set of rolls, the function of which is to break loose the oxide scale formed on the surface of slabs during heating. Water at about 1000 pounds per square inch pressure forces the loose scale from the surface. Scale is removed in order to keep it from being rolled into the steel, and thus impairing the surface of the finished product.

The slab moves in rapid succession through the roughing stands where it is reduced and elongated, until, upon leaving the last stand, it is slightly less than 1-inch thick and about 60 to 70 feet long, depending upon original dimensions. Roughing stands are so spaced that the slab is never being rolled in more than one stand at a time. Many mills are equipped with a slab squeezer which serves to trim and square the side edges after the slab has passed through the first roughing stand.

The finishing train consists of six stands, similar to roughing stands in construction.

After rolling, plates are passed through straightening rolls while still hot. The usual finishing operations may include: Straightening or flattening, cooling, laying-out and stamping, shearing or flame cutting, and inspecting. To keep the cooling of the plate uniform, roll tables at the cooling bed are provided with collared or disk rolls instead of plain ones. Plate ends are often sheared first, then the plate is passed over caster beds to the side shears. Plate mills are frequently equipped with rotary shears to trim the sides of plates as they come from the mill tables. Rotary side shears cut the side scrap off both sides of the plate simultaneously or cut the plate to the pattern and width size. Plate surface is carefully inspected and injurious imperfections may be removed or minimized by chipping or grinding. Special carbon and alloy steels are carefully inspected for internal condition by etch tests. Further finishing may include heat treating, descaling, pickling, painting, oiling and preparing for shipment. Plates may also be heat treated in various ways to obtain certain desired characteristics.

One of the most modern universal slabbing mills of its kind in the country is the 45 x 80 inch mill at the Homestead works of Carnegie-Illinois Steel Corp. Included in this unit is a stripper building, a 20-pit soaking pit building, the mill building with motor room, and 3 slab yards capable of storing approximately 100,000 tons of slabs.

Pits are 15 x 16 x 13 feet deep, gas-fired, nonreversing recuperating units equipped for full automatic operation and control. Six ingots 29 x 66 x 96 inches long weighing 40,425 pounds are usually charged in these pits, or four 34 x 66-inch big-end-up ingots weighing 55,000 pounds each with hot tops. Stainless steel ingots 28 x 60 inches and 27 x 46 inches are also heated in these pits.

All grades of alloy and stainless steels as well as low carbon steel can be rolled into slabs from 2½ to 20 inches thick and from 20 to 62 inches wide, from ingots weighing from 14,000 to as high as 70,000 pounds.

Mill equipment includes an ingot buggy, receiving table, ingot turner and scale, front and back mill tables with manipulators, pulpits, heavy duty upcut shear facilities, slab scale, tilting table and piler cars. Mill tables are driven from a line shaft and are of heavy construction, all equipment being provided with roller bearings throughout.

If rolled with the piped end leading, it is not unusual for too much metal to be cropped at the shear. The ingot turner installed makes it possible to avoid this, presenting the slab butt end first so that only enough metal is cropped off to square the slab. This results in a maximum of the excess metal being removed from the piped end.

Sufficient lift is provided in the slabbing mill to permit rolling on edge and it is standard practice at this plant to bring the ingot into the mill on edge for a scale breaking pass. Manipulator fingers on the delivery side of the mill facilitate edge rolling.

Mill rolls are direct driven by two 5000-hp motors through universal spindles, the top roll and spindles being counter-balanced. Roll speeds may be varied from 470 to 940 feet per minute and the mill can be reversed from base speed to base speed in 3 seconds.

The vertical mill, which has 36 x 80-inch rolls, is of the attached type and is driven through overhead gear reduction units by a 3000-hp motor. It differs from most designs in that the rolls are separate from the drives, being connected by easily detachable coup-

lings to facilitate roll changes. Overhead roll drives move with the edger rolls and are operated by the same adusting drive as is used for roll positioning.

Mill scale disposal combines both wet and dry systems. A steel-lined flushing flume runs under the mill from the ingot receiving table to the slab shear, pitching down from each end to discharge in a "Y" approximately 20 feet ahead of the universal mill. The scale pit, which is outside of the mill building, has a water capacity of approximately 43,000 gallons and will accumulate up to 150 tons of mill scale before starting to pile above the water line. From 4500 to 5000 gallons per minute of water, drawn from coolers and other equipment, keeps the wet system in operation. Normal drainage is by gravity but a 6000 gallons per minute sump pump is provided to remove water from the scale pit during flood stages of the river.

Heavy scale is caught on a grid consisting of 2 x 5-inch billets set on 8-inch centers across the flume. Ordinarily the larger pieces of scale are shattered and fall into the flume. Those remaining on the grids are hooked off into a tray running on a monorail in a corridor adjacent to the flume. These trays are dumped into charging boxes lowered into position on cars which are advanced to the tray unloading station in the working corridor. This combination of wet and dry scale disposal systems eliminates the possibility of clogging flumes, avoids wedging and blocking in chutes and hoppers and prevents mill shut downs being caused by faulty scale disposal.

A gas scarfing machine, designed to remove relatively thin layers of steel from the vertical edges of 3 to 8-inch hot slabs is located between the universal mill and shear. Control is from the operating pulpit where the operator can set from 3 to 7 scarfing nozzles in operation by pushbutton control. A fairly smooth surface is obtained with a table speed of 100 feet per minute and a gas pressure of 45 psi.

The hydraulically operated upcut shear is designed for cutting sections up to 20 x 60 inches and will handle lengths up to 20 feet. Maximum opening between the knives is 27 inches, the top head being adjustable through a motor-operated screwdown. A 1000-psi weighted type accumulator furnishes pressure for the shear cylinders and the hold-down. Three horizontal duplex plunger pumps, operating at 4500 psi, furnish power for the 45-inch hydraulic cylinders which operate the bottom knife. One or all of these pumps can be operated as desired to control the speed of cut, two pumps being sufficient to develop maximum capacity of the shear. Limit switches provide for unloading the pumps when the bottom knife overlaps the top knife by ½-inch, a cam-operated pilot valve serving as an additional safety precaution.

Cropped pieces drop onto a chute which delivers them to a flight-type conveyor. This takes them out of the mill building, discharging down a chute to the scrap yard floor where they can be handled by crane tongs directly into charging boxes. In this manner, segregation of various types of steel is easily accomplished.

*Fig. 8—Chipping slabs to remove imperfections*

Three motor-driven cars are provided to take slabs from the tilting tables. No. 1 and No. 2 cars are used for transporting slabs into the adjoining slab yards, No. 2 being used as a standby unit and for handling slabs too long for the other cars. No. 1 car does the bulk of the work. About 110 feet of slab yards A and B are without roof to speed up dissipation of the heat from the hot slabs and steam from water cooling. Scarfing docks for inspection, hand scarfing, and slab conditioning are in the A and B yards. Those docks are serviced by gantry cranes and scarfing outlets. The C yard is provided with scarfing outlets but has no gantry crane. Slow cooling and preheating pits are available in all three yards.

One hundred and five motors developing 21,675 hp are used in connection with the main drives and auxiliary equipment; 3 equivalent to 13,000 hp are on the main drive, 16 equivalent to 2010 hp are on the Ward-Leonard 500-v dc auxiliary drives, 44 equivalent to 2475 hp are straight 250-v dc magnetic control on auxiliary drives, and 44 motors equivalent to 4190 hp, are 440-v ac units. Three 3500 kilowatt, 700 v generators provide power for the main drives, being driven by a 7500 hp, 6600-v, 25-cycle, wound-rotor, fly-wheel induction motor. Two exciter sets furnish power for control. Power for the auxiliary motors on variable voltage control is supplied from two 7-unit motor-generator sets driven by 1250-hp, 6600-v, 25-cycle synchronous motors. The direct current auxiliary drives operating under magnetic controls are supplied by a single 1500 kilowatt motor-generator

Unique among plate mills, Lukens' 206-inch mill—the world's largest plate mill—is capable of rolling plates wider than any other mill can produce. It is a single stand unit, but of four-high design, one of the first four-high units in the United States. A 140-inch three-high mill located adjacent to it serves as a breakdown mill, as well as a single finishing mill. It is driven by an electric motor of 4000 hp at 397

rpm, as will be the 206-inch mill when alterations are complete.

Back-up rolls of the 206-inch mill, 50 inches in diameter and with bodies 206 inches long, operate in bronze bearings, and work rolls, 34 x 206 inches, also run in bronze bearings, except for the bottom bearing of the top work roll, where a composition bearing is installed.

Maximum roll lift is 42 inches. Two 150-hp motors operate the mill screws, which are 16 inches in diameter and of 2-inch pitch. Rolls are hydraulically balanced.

Roller tables preceding the mill are 83 feet, 8 inches in length and composed of rollers of both disk and barrel types, driven by line shafts and bevel gears. Above the approach table, there is a turnover mechanism consisting of three chain-suspended bars connected to an elliptical drum. The bars are lowered into the mill table and the ingot or breakdown run over the bars. Operation of the elliptical drum turns the ingot over without allowing it to drop upon the table. Front and back tables are provided with dual drives with alternate rollers tapered so that ingots may be turned in a horizontal plane for cross rolling.

On the exit side of the mill, tables extend for a distance of 95 feet, 5 inches to a hot leveler containing 7 rolls, 16 x 210 inches. Following this is a chain-type cooling bed 90 x 180 feet long, and in the run-out table from this bed is a 206-inch hydraulically operated gate type shear with a capacity of 1½-inch thick cold plate.

Instead of proceeding over the cooling bed, plate may proceed straight from the mill to an adjacent building for slow cooling or annealing. One car bottom furnace 41 feet, 4 inches x 17 feet, 2 inches is installed here, together with provisions for burying plate in sand for slow cooling.

For descaling plates, a 1300 psi hydraulic descaling system has recently been installed on the 206-inch mill with sprays above and below the plate. Descaling is also greatly facilitated by the fluted middle roll used in the 140-inch mill when operating as a roughing unit.

Since 1918, when their 206-inch mill was completed, Lukens has produced the widest and heaviest steel plates obtainable anywhere in the world.

Carbon and alloy steel plates can be rolled on the 206-inch mill up to 195 inches wide or up to 25 inches thick with finished plate weights up to 70,000 pounds; also clad steel plates, in extra widths and thicknesses.

Many producers of other metals, including nickel, aluminum, copper, brass and silver, frequently use these facilities for rolling wide and heavy plates.

Among important uses, wide plates provide industry with giant size tanks, boilers and pressure vessels with a minimum of joints, saving thousands of dollars in fabrication costs. Heavy plates have important applications in bases for machines, bolster plates, flywheels, chipper disks and other industrial equipment.

The 100-inch mill at the Homestead works of Carnegie-Illinois Steel Corp. is an excellent example of a unit designed to produce large tonnages of high-quality steel plates, accurate in gage and width and with a surface quality comparable with that of quality hot-rolled strip.

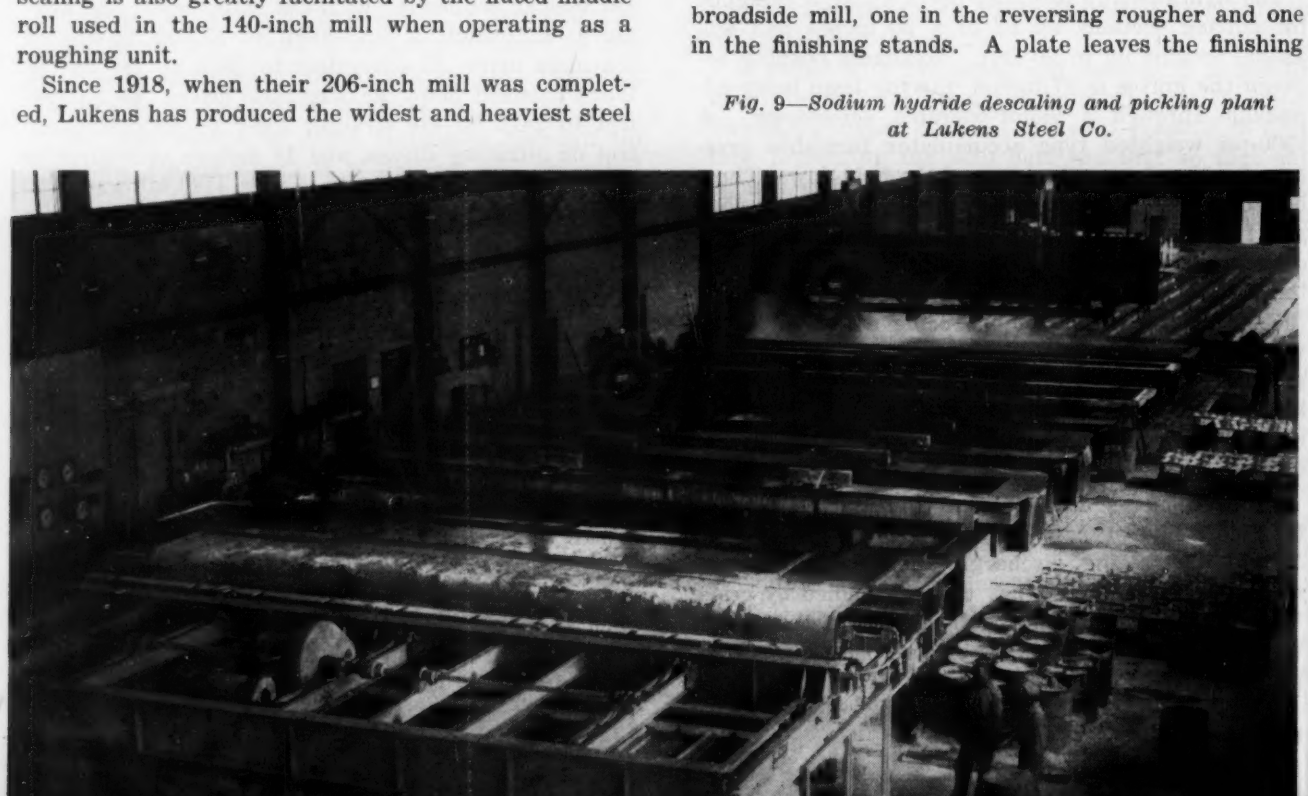
This mill was intended primarily to roll commercial plates from 20 to 90 inches in sheared width by 3/32 to ⅝-inch in thickness. It is capable of producing plates 1-inch thick, if desired.

The mill equipment consists of an approach table, two-high scale breaker, four-high broadside mill, a slab squeezer, four-high reversing rougher and four stands of four-high finishing mills. In addition, there are the necessary tables, transfer hot levelers, crop kick-offs and stacking beds. These are all connected shears, rotary trimming shear and shears, scales and so that plates proceed from one operation to another in a continuous or semi-continuous procession.

Design of plant provides extreme flexibility. Ordered gages or widths of plate, within reasonable limits, can be changed from the rolling of one slab to another. Band edge or sheared plate can be produced at will.

Normal operations contemplate three slabs going through the mill at the same time: a slab at the broadside mill, one in the reversing rougher and one in the finishing stands. A plate leaves the finishing

*Fig. 9—Sodium hydride descaling and pickling plant at Lukens Steel Co.*



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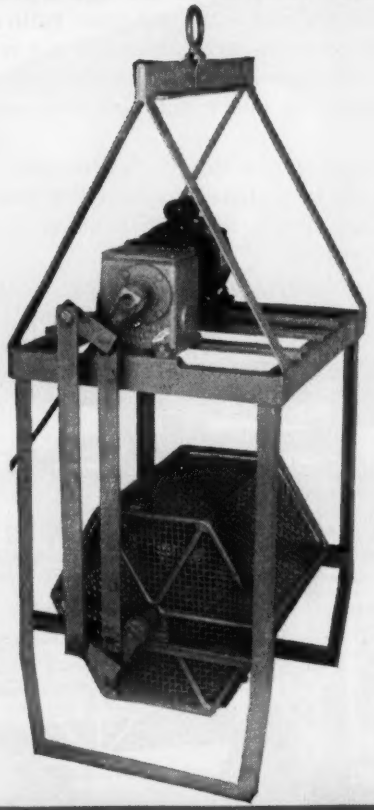

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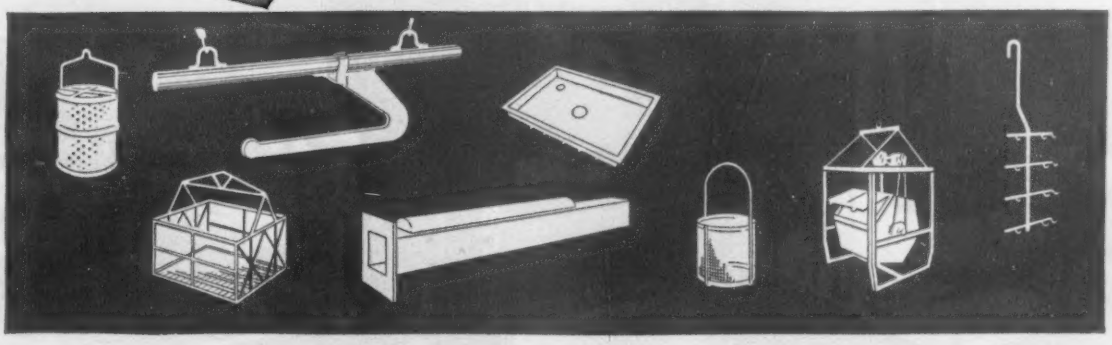

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stands on the average of one every 50 seconds. This mill can roll upwards of 840,000 tons per year.

The approach table for the scale breaker is equipped with four skewed rollers so that slabs may be turned when it is desired to roll broadside on the scale breaker. This stand is known as a two-high, closed-top roll stand with hydraulically balanced top roll.

In the scale-breaker screwdown, each screw is driven through one reduction of helical gears and one reduction of worm gearing. The ratio is 45 to 1. Speed of the screw is approximately 11 inches per minute.

Drive is by means of a 1000 hp, 490 rpm, 660 v, ac, 25 cycle, wound-rotor induction motor through a double-reduction drive with flywheels.

The broadside mill is a four-high mill with work rolls 42 inches in diameter and 120 inches long and with back-up rolls 52 inches in diameter.

This mill is used for elongating slabs broadside from nominal widths to rough widths required to make the ordered product. Very heavy drafts are taken, and 60-inch wide slabs may be spread to 96 inches in one pass.

After coming through the scale breaker, slabs are turned 90 degrees by a turntable elevated by crank and turned by worm gear.

A motor-operated pusher then places the slabs squarely into the mill. This pushing operation is necessary to prevent the mill from pulling the thick slab into the mill one corner first.

A second turntable after the mill again turns the slab 90 degrees, which makes the broadside length correspond to the rough width of the plate.

The mill is driven through a flywheel and gear set by a 4500 hp, 660 v, 370 rpm, 25 cycle, alternating-current motor. The roll speed is approximately 17 rpm, which is equivalent to 104 feet per minute based on a 42-inch roll diameter. The top back-up roll and top work roll are balanced.

Screwdown of the broadside mill is motor-operated by two 50 hp motors driven through a reduction of spiral bevel gears and worm and gear, ratio of 45 to 1 and speed is approximately 11 inches per minute. A magnetic clutch between motor-shaft extensions permits roll alignment and synchronizes speeds of both motors.

The slab squeezer, which is located just after the broadside mill, is designed to hold the slab flat and apply pressure to the edges in a manner similar to pressing or forging.

*(To be continued)*

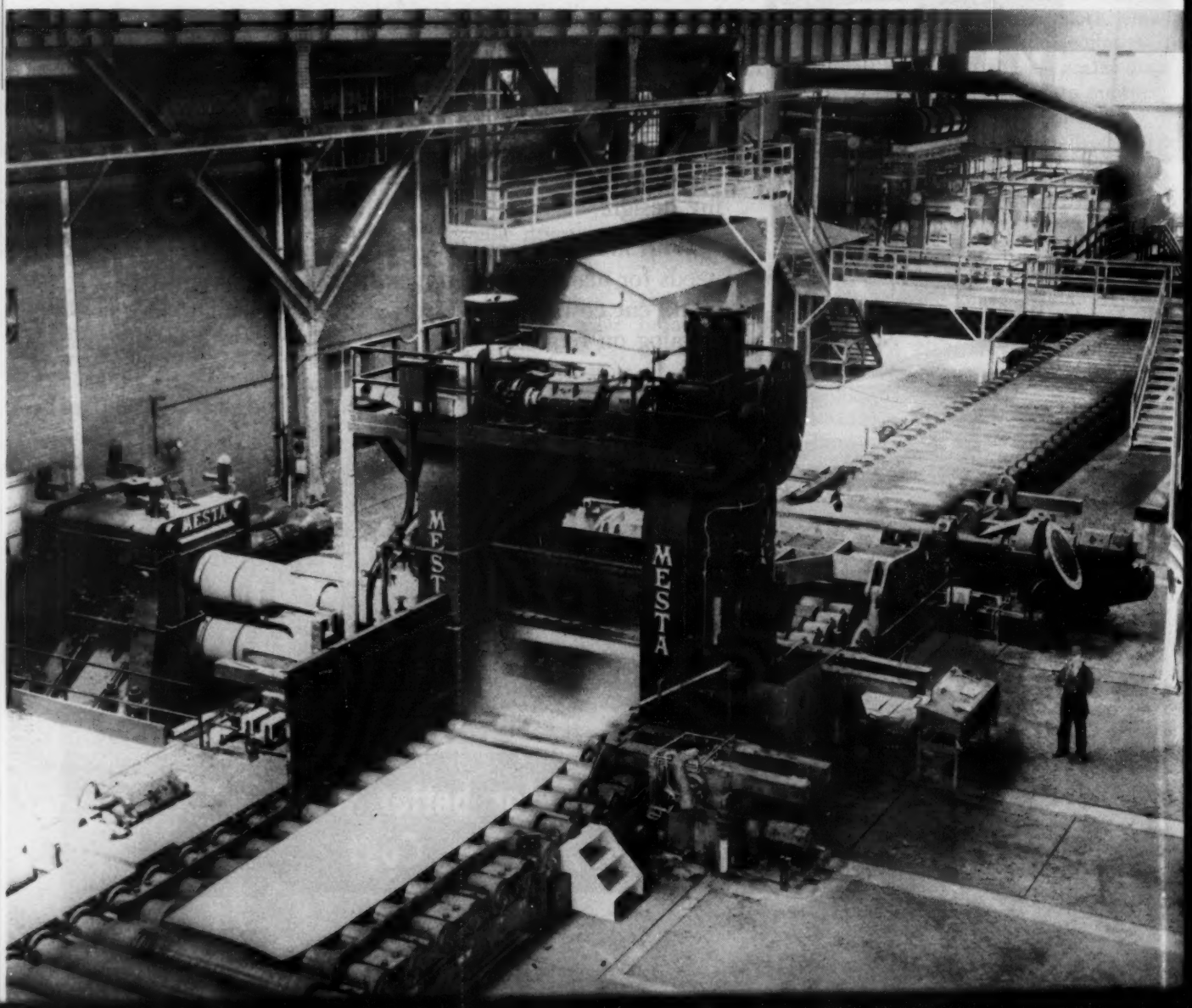


*Fig. 10—Delivery side of 110-inch four-high reversing plate mill, a truly modern plate rolling unit*

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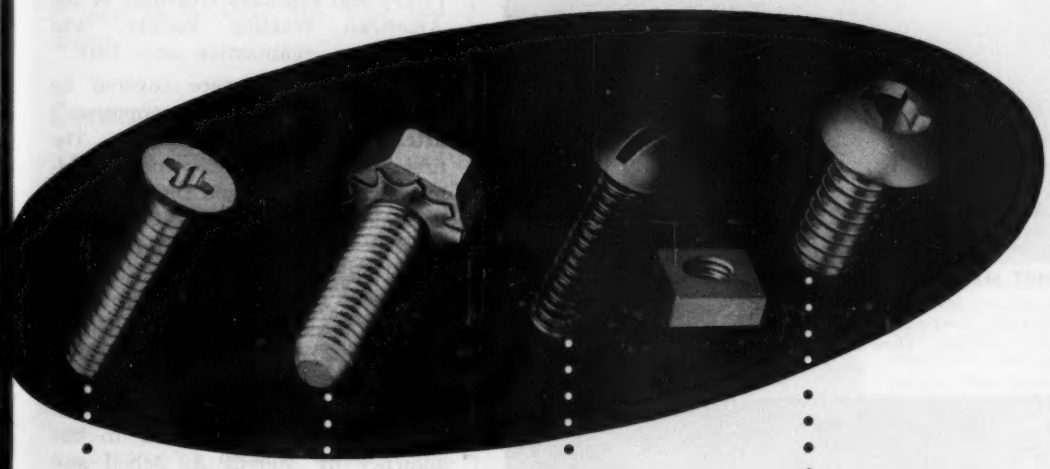

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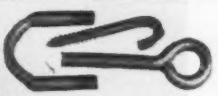

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## J. F. Lincoln Honored At Welding Symposium

Over 400 welding society members paid tribute to J. F. Lincoln, president, Lincoln Electric Co., Cleveland, for his outstanding work in promoting arc welding, during the annual welding symposium banquet, Apr. 13 at Hotel Statler, Cleveland.

Individuals attending the Cleveland Welding Section sponsored symposium, besides dedicating this year's meeting to Mr. Lincoln, also publicly honored M. M. Kelly, national secretary and assistant treasurer of the American Welding Society, who served the organization since 1918.

Three subjects were covered by speakers during the symposium's afternoon technical conference. The first speaker, J. R. Henry, chief welding engineer, Cleveland Diesel Engine Division, General Motors Corp., discussed "Welded Steel Bases for Diesel Generator Sets". D. C. Holt, assistant construction manager, Stacey-Dresser Engineering, Cleveland, pointed out how auxiliary heating devices aided welding. Relation of heat treatment to welding ferrous metals was explained to the audience by Merrill A. Scheil and John J. Chyle, director of metallurgy and of welding research respectively of A. O. Smith Co., Milwaukee.

Ross J. Yarrow, Republic Structural Iron Works, Cleveland, served as technical chairman of the meeting and M. S. Shane, Cleveland Electric Illuminating Co., was toastmaster for the evening affair. G. N. Sieger, president, American Welding Society and president of SMS Corp., Detroit, greeted members on behalf of the society's national headquarters.

## Process Developed for Welding Chrome Pipe

Chromium pipe being fabricated for installation in a Texas oil refinery was welded successfully by a process developed by Houston Pipe & Steel Inc., Houston. Process involved bringing the temperature of the joint up to 600 to 800° F with a large oxyacetylene preheating tip. Temperature was kept at that point while welding was performed using General Electric chrome electrode type W-1502 which bears ASTM-AWS specification No. E-502.

Upon completion of the welding, the temperature was raised to 1200 to 1350° F and the joint wrapped with asbestos tape to a minimum thickness of 1 inch. It was then allowed to cool to room temperature.

It was pointed out by the Houston company that this technique did not make the weld metal so hard that it became brittle.

Laboratory tests made showed an ultimate tensile strength of 73,200 psi and a satisfactory rating on a 180-degree root bend. Brinell hardness in the weld was said to be 248, while Brinell hardness in the pipe was 174. Chemical analysis of the weld metal showed 7.73 per cent chromium in the weld and 4.53 per cent chromium in the pipe. Where greater ductility and elongation was required, a furnace anneal at 1600° F was given after the pipe had cooled.

## Ceramic Finish Protects

Mufflers of Navy submarines and other vessels are being protected against the ravages of corrosion, erosion, acid fumes and thermal shock by a new ceramic finish developed by Seaporcel Metals Inc., Long Island City, N. Y. Although some of these mufflers have been in service for several years, it is said that no replacements as yet have been necessary. Used during the recent war on hospital ships, incinerator uptakes, sanitary ware and other items, the finish has the advantage of not only saving the cost of the replacement muffler itself, but the cost of installation and consequent tying up of the vessel are eliminated.

## Movie Features Crane

Featured player in the 16 mm sound and full color motion picture announced by Sales Division of Byers Machine Co., Ravenna, O., is the Traveler, a ½ and ⅝ cubic yard rubber-tired excavator and crane. The movie, entitled "There's a Difference", consists of 20 minutes of scenes showing the differences which are built into the machine, as well as various job applications for which it is equipped. Driving the self-propelled, one-man operated machine from one job to another and actual views of it in operation with shovel, crane, backhoe, dragline and clamshell attachments are shown.

## Lathe Film Offered

Availability of a sound motion picture, "Three for One," on the model 30-H Man-Au-Trol horizontal lathe is announced by The Bullard Co. of Bridgeport, Conn. Offered for industrial group showings, the 16 mm film runs approximately 18 minutes.


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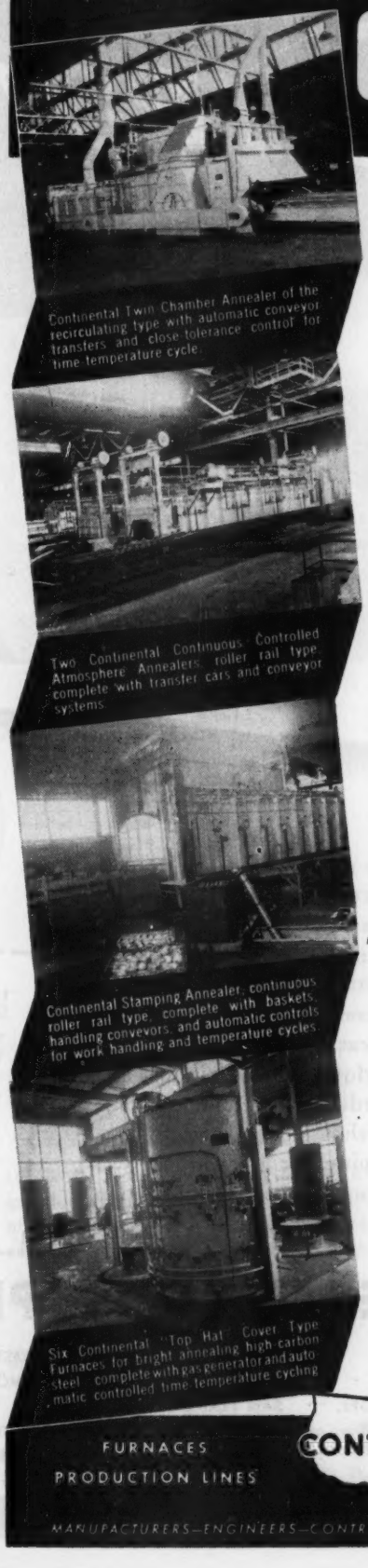
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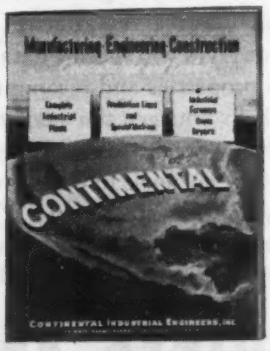


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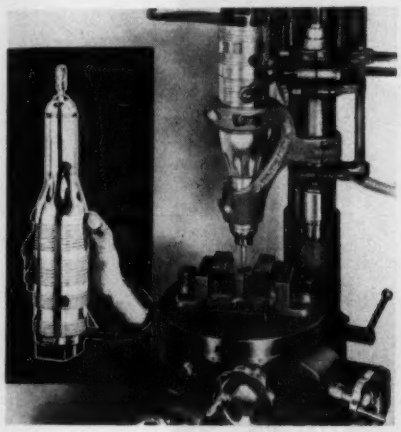
# New Products and Equipment

## Grinder-Miller

Speeds of 45,000 rpm and over 1/5-hp are claimed for the super 40 grinder-miller, offered by Precise Products Co., 1328-30 Clark St., Racine, Wis. Used with or without a Coolflex extension or in machine set-ups, it operates mounted wheels up to 1¼ inches in diameter, unmounted wheels, cut-off wheels and metal saws with special arbors up to 2 inches in diameter and ¼-inch wide using speed



control. Model HS midget mills and carbide micro mills up to ⅜-inch in diameter and 1 inch wide may also be used.

Line of tools and accessories adapt the tool to almost any production set-up in standard lathe, milling machine, drill press or other stationary machine tools. Features include machined aluminum alloy housing and prelubricated precision ball bearings. The aircooled motor is protected from overload by replaceable Fusetrons. With speed control, speed can be regulated with a range of 15,000 to 45,000 rpm.

**Check No. 1 on Reply Card for more Details**

## Belt Conveyor

All parts of the No. 101 line of slider bed belt type conveyors made by Coburn-Foster Conveyor Co. Inc., 9362 Ewing Ave., Chicago 17, Ill., are punched and marked and are shipped in a knocked-down condition for erection as per engineered erection drawings. Moving parts are equipped with antifriction bearings. Lengths from 10 to 100 feet are available and the widths of 8, 12, 18 or 24 inches. Elevations are adjustable from 24 to 30 or 30 to 36 inches. Belt speeds of 60 or 36 feet per minute are obtained from ½, ¾ or 1 hp gearhead motors.

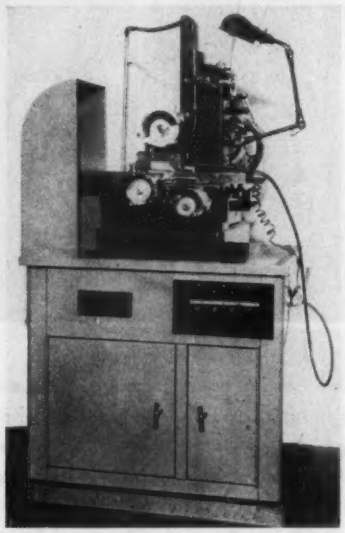
Conveyors have ample leg room underneath the belt. The frame is of accurately punched angle iron with many interchangeable parts. Conveyors may be lengthened or shortened after they have been placed in service. Belts are of three ply canvas or Neoprene impregnated. The slider bed is of tempered Prestwood, a hard surfaced material. Joints of side rails and the bed are staggered to insure good alignment and ease of assembly.

**Check No. 2 on Reply Card for more Details**

## Surface Grinder

Jakobsen Tool Co., 213 Glenwood Ave., Bloomfield, N. J., is manufacturing a sensitive surface grinder designed for tool makers and small parts grinding. Sensitive enough to split ten thousandths of an inch, the grinder can also be used for heavy roughing. Provision for variable wheel speeds and use of wheel diameters from 1/16 to 5 inches or more is incorporated in the machine.

Coolant, supplied from the system within the machine, can be thrown on



the work from almost any angle. All grinder parts exposed to wear, ways and gibbs and lead screws are hardened and ground of high-carbon high-chrome steel.

**Check No. 3 on Reply Card for more Details**

## Remote Shear Clutch

A remote electric clutch control for Cincinnati all steel shear, made by Cincinnati Shaper Co., Cincinnati, O., permits the operator to trip the press clutch, even when shearing wide or long sheets. Use of this clutch attachment supplements the standard clutch tripping arrangement, a full length mechanical treadle. Handling is speeded, man hours decreased and output of the machine increased with the control.

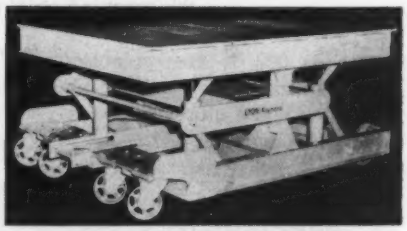
Electric clutch control is also furnished with two foot switches and a selector for single or double operator control. With double operator control, both operators must operate their foot switches before the clutch

will trip and the shear will start. The remote control foot switch may be placed at any position convenient to the operator.

**Check No. 4 on Reply Card for more Details**

## Elevating Trucks

Large, cumbersome dies which present a special handling problem may be handled with the hydraulic elevating truck of 20,000 pound capacity developed by Lyon-Raymond Corp., 1547 Madison St., Greene, N. Y. Truck was built with a top surface measuring 60 x 84 inches. Four hydraulic cylinders provide a 16-inch range of elevation from 26 inches in the lowered position to 42 inches when fully elevated. The power operated pump has a ¾-hp motor.



Synchronization of the four lifting cylinders was made possible by a toggle lever arrangement with center guides to keep the table top level

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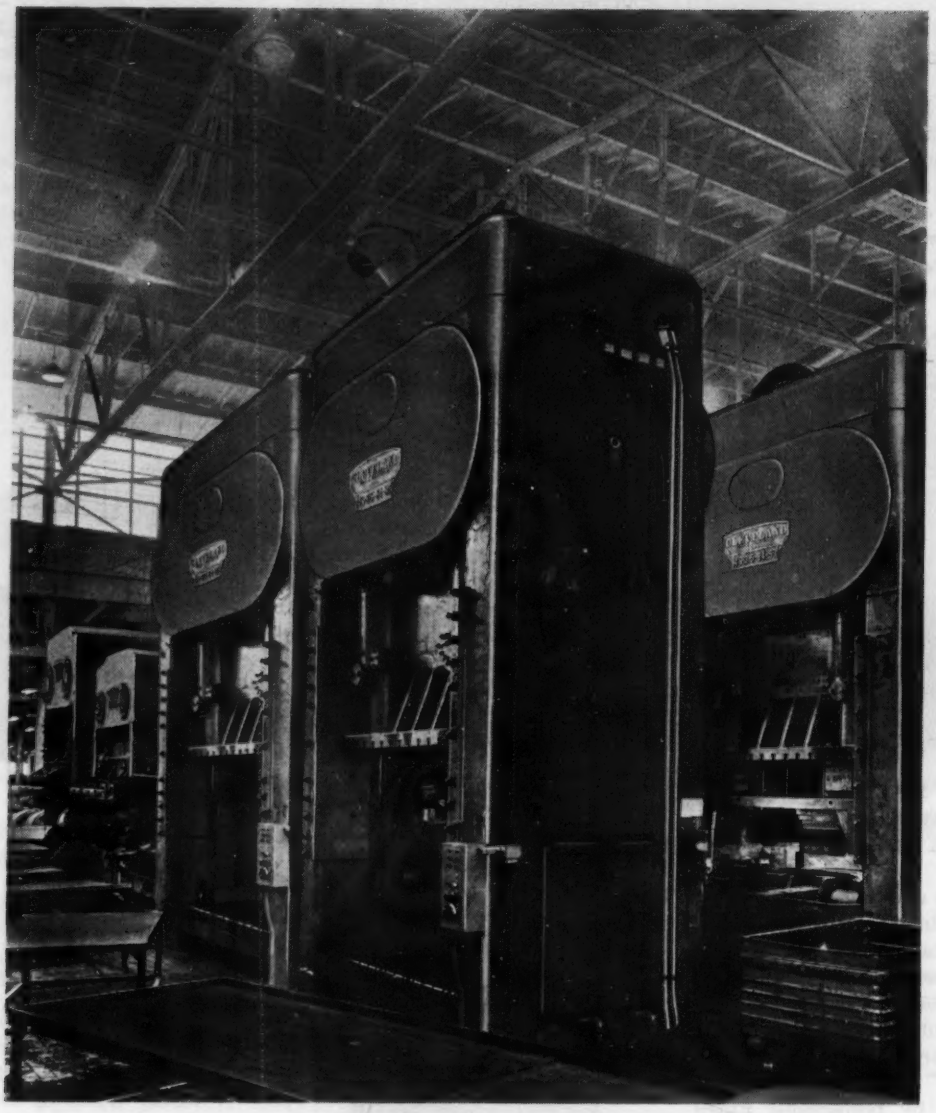

● For many years Cleveland Presses have been used by the automotive industry. In this highly systematized field delays are extremely costly. The production line must maintain a smooth flow of parts at all times. It is a testimonial of the highest sort to the Reliability of Cleveland Presses that they are in demand by this great industrial group.

Shown here are a group of five Cleveland Presses in one of the nation's automotive plants. They are used in a parts production line, working around the clock. They were chosen for reliability shown by earlier Cleveland Presses... their ability to stand up under the punishment called for in high speed production.

*For complete information on all models of CLEVELAND PRESSES write for folder 56*

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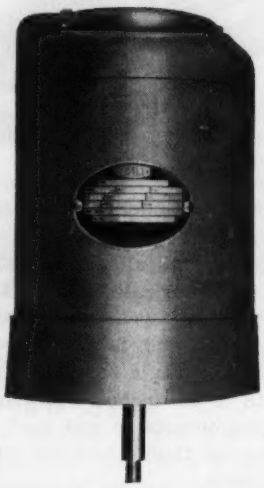
at all times. Portability under full load is made possible by equipping the truck with four 12-inch diameter rear wheels having ball bearings and four heavy duty 8-inch diameter swivel casters with roller bearings. When fully loaded, the truck can be moved with an industrial tractor.

**Check No. 5 on Reply Card for more Details**

## Pump Motors

Suitable for either vertical or horizontal mounting are Jet pump motors, manufactured by the Brown-Brockmeyer Co., Dayton, O., in ratings from 1/6 through 1 hp, 40° C rise for continuous duty. Mounting dimensions are identical for all ratings.



Standard shaft extension or threaded shaft for direct connection to the pump impeller can be furnished.

Motors are equipped with ball bearings lubricated and sealed at the factory. Motors are offered in single phase capacitator state induction run type, of 115 or 115/230 v. Single phase motors have an automatic thermal overload protector. Two or three-phase squirrel cage induction types, 220 or 220/440 v, can be furnished from ½ to 1 hp.

**Check No. 6 on Reply Card for more Details**

## Automatic Lathe

All bearings and oil pump gears are turned and chamfered and oil grooves are cut on cam shafts in a single operation with the model LR Lo-swing automatic lathe built by Seneca Falls Machine Co., Seneca Falls, N. Y. Machine is equipped with a two-jaw scroll chuck which clamps and drives the shaft from a cam. The swivel type tailstock is air operated as is the movement of the spindle quill. Grooving attachment is driven and timed from the main drive shaft.

After cam shaft is placed between centers, the front carriage slides and tools advance in rapid traverse to the cutting position and then slow down for normal feed. Squaring, chamfering and grooving tools, mounted on two automatic back squaring attachments, are timed to cut immediately after the front turning tools have ceased cutting. After rear tools have ceased cutting, all tools and slides are returned to starting position in rapid traverse. All movements are automatically controlled.

**Check No. 7 on Reply Card for more Details**

## Whiteprinter

Anything drawn, typed, written or printed upon translucent mediums may be reproduced at speeds up to 105 sq ft per minute on the new large volume whiteprinter announced by Charles Bruning Co. Inc., 4754 W. Montrose Ave., Chicago 41, Ill. Prints from post card size up to 42 inches wide and any length may be made.

Direct positive prints (black lines on white or tinted stocks) may be produced directly from original drawing or document without intermediate steps by the Volumatic model 93. Operator feeds material to be duplicated into the machine and the rest is completely automatic. Prints are delivered, stacked, flat and dry, ready for use. The process used by the machine is odorless and no ventilating ducts are required.

**Check No. 8 on Reply Card for more Details**

## Grinding Attachment

Developed by R. G. Haskins Co., Chicago, Ill., is a high speed grinding attachment which steps up the speed delivered by the No. 2 and 4

Haskins flexible shaft machines at a rate of 2 to 1. By speeding up No. 2 machine to 22,000 rpm and No. 4 machine to 16,000 rpm, grinding time is lessened and wheel life increased.

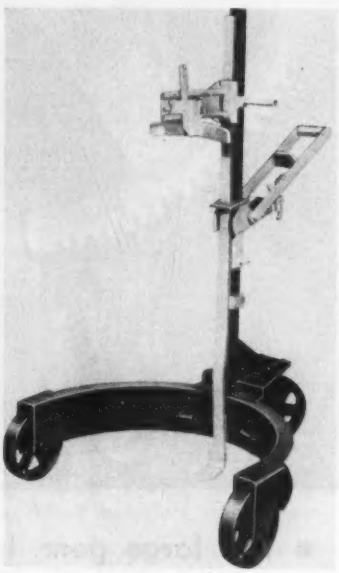
Unit was developed for surface and deep cavity (up to 5 inches deep) grinding and polishing operations. It permits sensitive operation of small rubber and resinoid bond grinding wheels up to 2⅝-inches in diameter.

**Check No. 9 on Reply Card for more Details**

## Drum Truck

Designed to lift, transport and release any size or type of steel drum, wood barrel or cylindrical container is the Drumobile, manufactured by Ernst Drumobile Division, Brantwood Products Inc., 115 Brayton St., Buffalo 13, N. Y. The model 800 series is designed for loads up to 850 pounds in 50 and 60 gallon drum sizes.

The three-wheeled carrier picks up



the container, carries it in a level, upright position and deposits it without being touched by human hands and without tilting. The lever-handle, after being used in lifting the load and actuating the safety lock, becomes a free-swinging steering column which may be adapted to any desired height.

**Check No. 10 on Reply Card for more Details**

## Tube End Finisher

Production speeds of 800 to 1200 tube ends per hour are possible with the series 600 tube and rod end finishing machine manufactured by Pines Engineering Co. Inc., Aurora, Ill. Automatic air operation is available on the small bench model machine designed for deburring and other end finishing operations on work up to 2 inches in diameter. Use of a foot switch operated air cylinder with

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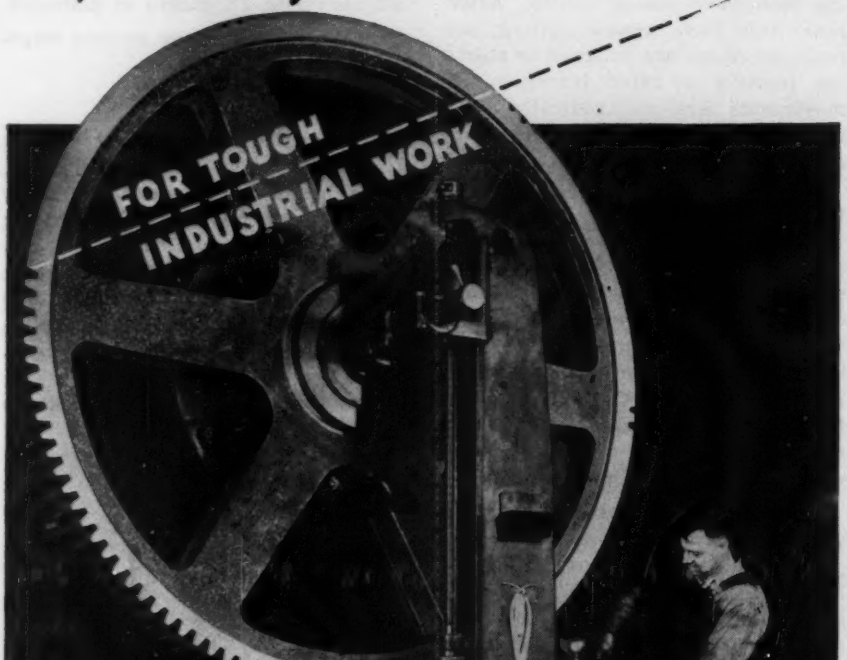


• This large gear, in the making, will soon be doing hard work in a steel mill . . . just one of many gears made by Horsburgh & Scott in sizes up to 12 feet in diameter and 20,000 pounds weight. There's a Horsburgh & Scott gear for every job . . . accurate . . . rugged . . . built to endure . . . a trial will prove their quality.

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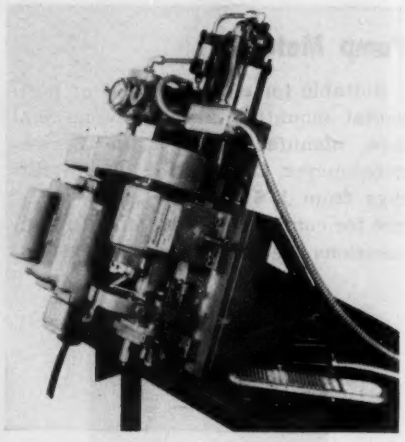
hydrocheck control leaves the operator's hands free. Tooling can be furnished for such other end finishing operations as center drilling, rod chamfering, drilling, reaming, pointing and boring in addition to tube deburring.

Interchangeable 2-step V-belt

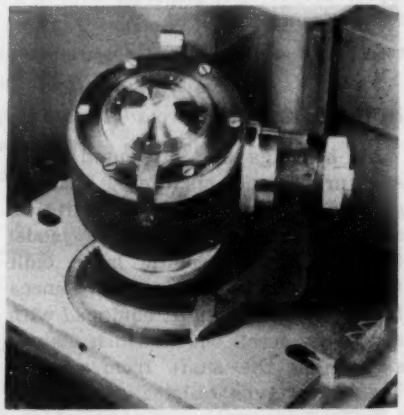


sheaves are used to permit selection of eight possible spindle speeds. Chuck is bored in place to assure concentricity and alignment with the spindle. Prelubricated bearings eliminate excessive wear and maintenance. Entire unit is assembled and doweled to a single base plate measuring 18 x 30 inches. Replaceable chuck jaw inserts to suit each work diameter are thumb screwed into the master jaws.

**Check No. 11 on Reply Card for more Details**

## Grinding Fixture

Sharpening and grinding of chip breakers on ejector type tool inserts may be performed in the fixture developed by Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich. The device provides ample clearance for grinding any insert with either flat



or dished chip breaker. It is designed for ready duplication of established grinds.

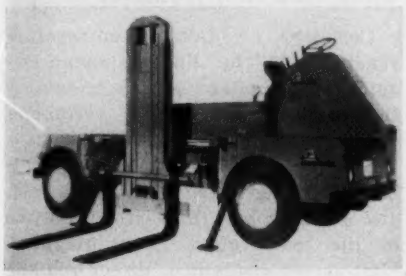
Two calibrated setting dials pro-

vide for accurate adjustment in any position and cam index plates speed up the grinding of rectangular, square and triangular inserts. The stop is lifted out of position for grinding round inserts. Fixture spindle is of the preloaded ball bearing type and is ground after assembly in the fixture to assure perfect alignment. Collets are available for all type inserts in standard sizes.

**Check No. 12 on Reply Card for more Details**

## Loader-Carrier

Performing as a combined loader, carrier, and motor truck is the Traveloader, developed by Lull Mfg. Co., 3612 E. 44th St., Minneapolis 6, Minn. It loads itself from the side onto its carrying deck and transports



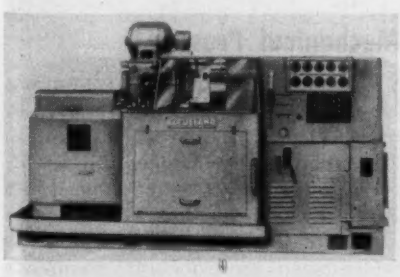
the load through narrow aisles or over the road. Unit operates at speeds up to 30 mph.

Three models of the Traveloader are available with 3000 10,000 and 30,000 pounds lifting capacity. All feature a four wheel drive, full hydraulic control, full power hydraulic loader operation and the ability to handle heavy, long materials.

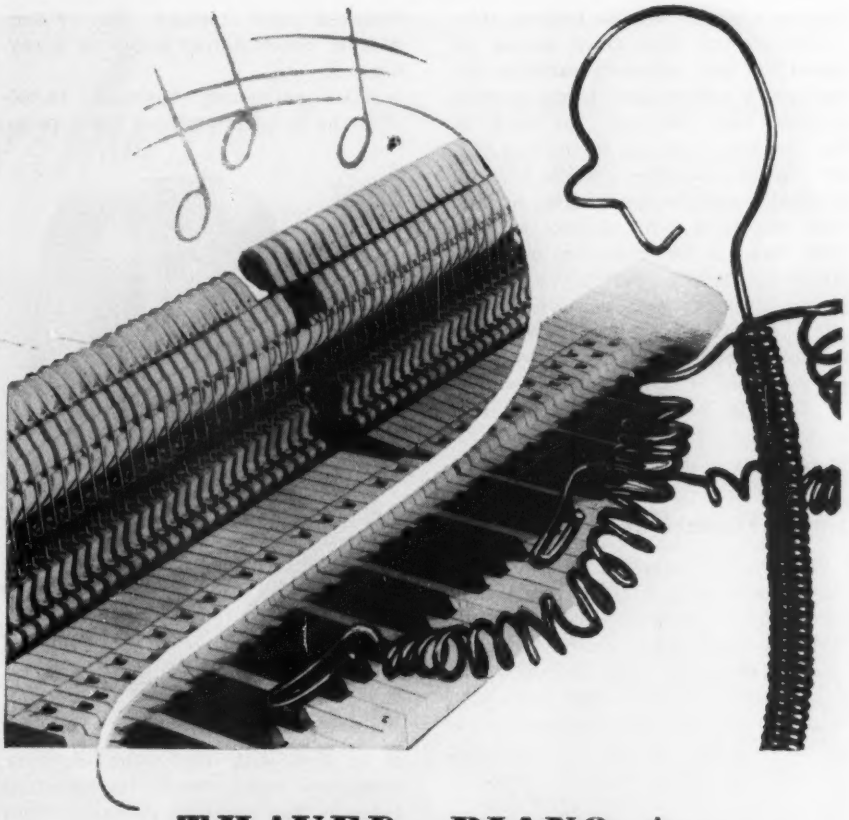
**Check No. 13 on Reply Card for more Details**

## Screw Machine

Among the improvements in the Dialmatic model AB 2½-inch single spindle automatic screw machine manufactured by Cleveland Automatic Machine Co., Cincinnati 12, O., is a redesigned main guarding to permit easy access to the tooling and to facilitate chip removal. Front panel in the main guard can be quick-



ly lowered, forming a chute, so that chips can be raked out of the pan directly into a container. Use of Plexiglas front and rear guard in-

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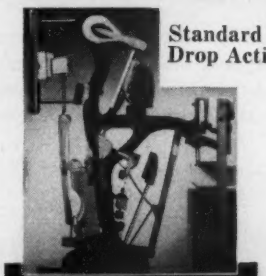
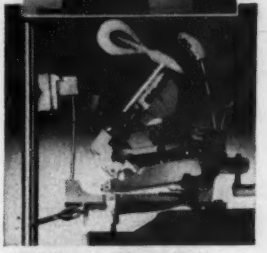


Standard Drop Action



Direct Blow Action

*Thayer Action Company Rockford, Illinois

Thayer piano actions are precision striking mechanisms within the piano. They are models of mechanical perfection requiring master craftsmanship and the finest materials available.

Since *uniform* wire quality is of vital importance in their product, the Thayer Action Company, largest manufacturers of piano actions in the world, specify special Keystone wire. Several types of Keystone wire are used . . . galvanized, liquor finish, coppered and extra brite basic. Each type of wire performs a specialized function . . . yet they have in common the fundamental qualities of extremely close tolerance, uniform temper and proper finish.

The Keystone organization takes pride in fulfilling the exacting requirements of this famous company.

KEYSTONE MUSIC SPRING WIRE

SPECIAL ANALYSIS WIRE for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

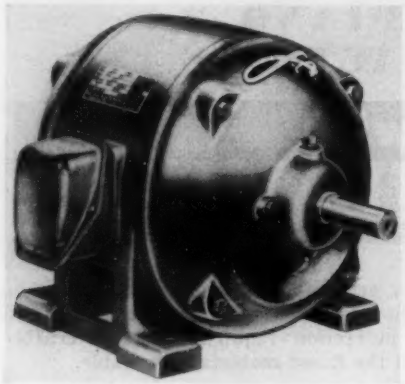
creases visibility in the tooling area.

And electric feed drive makes independent and infinitely variable forward and return tool feeds possible without cam changes, for each of the five tool positions in the tool turret. Quick-disconnect plugs link all electric connections leading to and from the feed drive system to simplify removal for inspection or maintenance. Electric control panel has signal lights to aid operator in machine operation. Lights show direction of spindle rotation, whether spindle is in fast or slow drive and whether machine is in feed or rapid traverse.

**Check No. 14 on Reply Card for more Details**

## Single Phase Motors

Integral horsepower, single phase motors are being produced in a new line by Louis Allis Co., Milwaukee 7, Wis. The centrifugal switch formerly used to disconnect the starting condensers from the line after the motor is up to speed has been replaced by a voltage relay. A control cabinet mounts the relay and also includes



an across-the-line starter and the necessary capacitors.

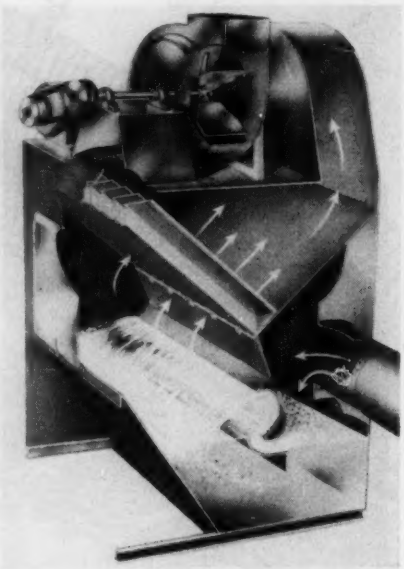
New motors are built in capacitor start induction run types in ratings of 1 and 1.5 hp and in capacitor start capacitor run types in ratings of 2, 3, 5, 7.5 and 10 hp. Capacitor run types are supplied with oil type running capacitors which are also mounted in the control cabinet. Line is available in an open drip proof, splash proof, totally enclosed, fan cooled and explosion proof construction.

**Check No. 15 on Reply Card for more Details**

## Dust Collector

A hydrostatic precipitator that cleans air by the combined action of centrifugal force and a thorough intermixing of water and dust-laden air is the principle of the design 2 type N Roto-Clone, manufactured by American Air Filter Co. Inc., 215 Central Ave., Louisville, Ky. The redesigned unit reuses the water without recirculation pump or spray nozzles.

With capacities through 48,000 cfm, the unit maintains a lower pres-

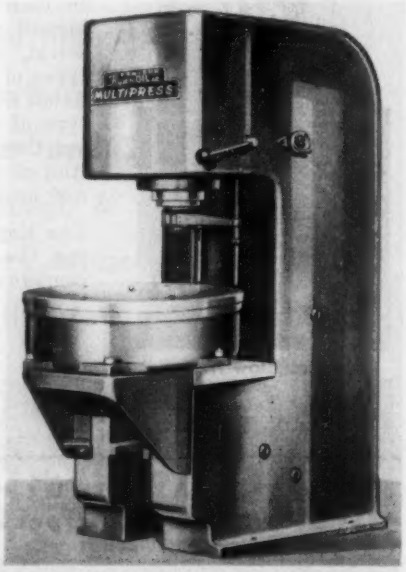


sure drop with the same cleaning efficiency and water recirculation rate. They can be operated from 50 to 120 per cent of the nominal rating without affecting the collecting efficiency. All sizes are offered with either manual clean-out, sludge ejector or hopper bottom arrangement.

**Check No. 16 on Reply Card for more Details**

## Hydraulic Press

Operational advantages of the new 25-ton Multipress oil-hydraulic press, announced by Denison Engineering Co., Columbus, O., include fast action




with high-tonnage pressures under accurate, regulative control. Precision adjustments for multiple ram actions give flexibility for applications in varied industries. Press has a 15-inch stroke, 25-inch daylight opening and a 12-inch throat depth.

Ram approach to work is variable and can be preset at any speed up to 530 inches per minute. Ram stroke length, pressing speed and ram pressure can be preset. Press may be equipped with a choice of control including dual hand lever, single lever, foot pedal or electric pushbutton types. Operation may be with automatic valve controls for single or continuous cycling or vibratory repeat strokes. Available is a 33-inch diameter hydraulic index table which provides indexing for either 6 or 12 stations.

**Check No. 17 on Reply Card for more Details**

## Open Hearth Pyrometer

Designed for taking temperature readings of the limited range required for molten ferrous metals, is the open hearth optical pyrometer offered by Pyrometer Instrument Co. Inc., Bergenfield, N. J. Reading scale has been lengthened over 40 per cent and covers only the critical portion of the temperature range required. Unit is self-contained, direct reading and light in weight. It allows the rap-

id reading of temperatures of the smallest streams, fast moving objects or minute spots without the use of correction charts or other outside accessories.

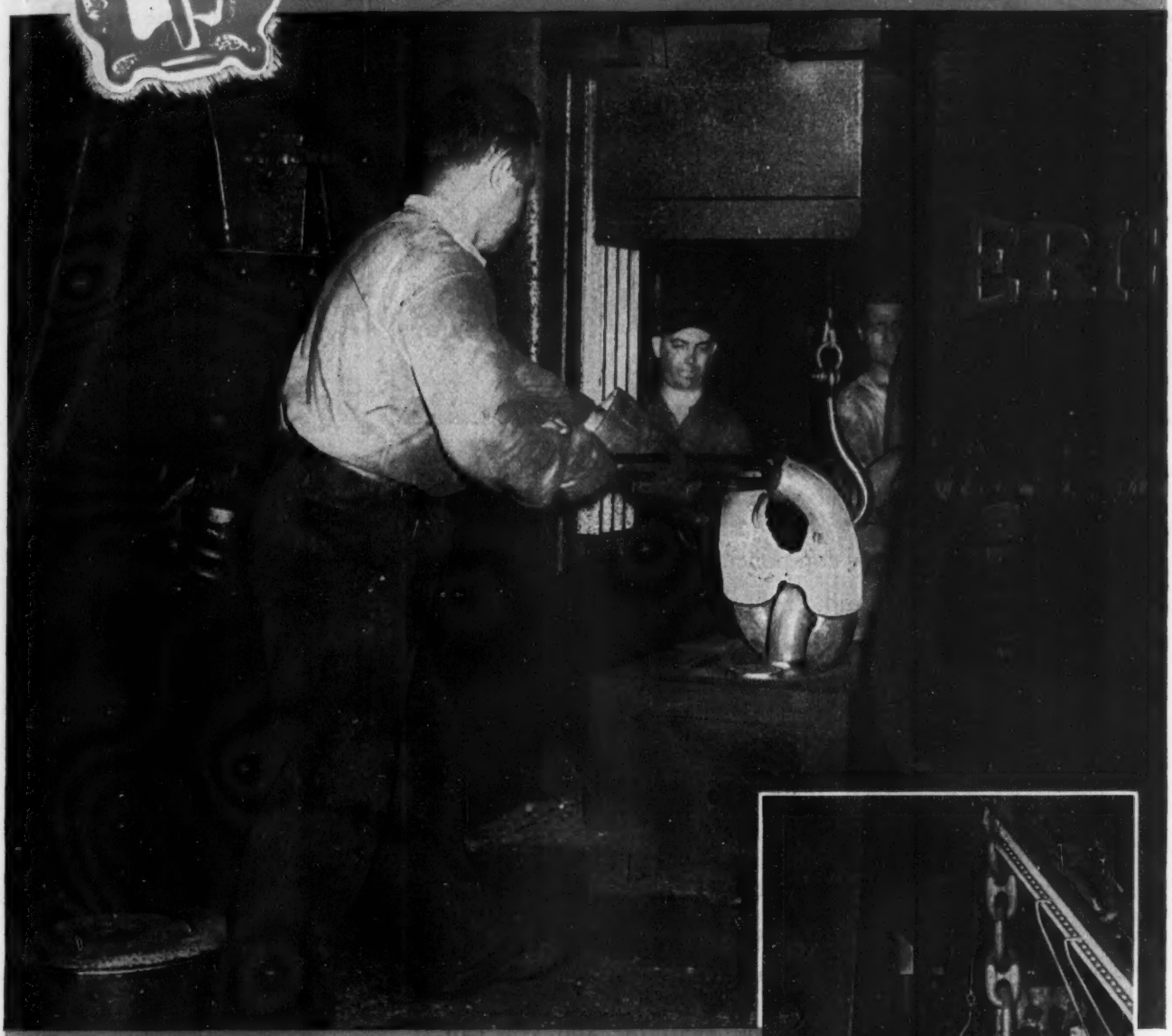
Standard temperature scale for black body conditions permit coverage from 2200 to 3000° F and an additional scale in red, corrected for the emissivity of molten iron, steel, Monel, etc., reads from 2400 to 3300° F. Both scales are subdivided into 10 wide degree divisions so that actual temperature readings can be made to within a very few degrees.

**Check No. 18 on Reply Card for more Details**

## Mechanical Presses

Designed for stamping operations employing standard, progressive, or multiple dies, a line of medium to high tonnage mechanical presses offered by Danly Machine Specialties Inc., Chicago, Ill., has heavier plate structure through greater steel mass which means more accurate stampings and longer die life at higher operating speeds. The various sizes and types have speeds up to 250 strokes per minute with capacities from 50

# Anchors Aweigh! ON CHAINS FORGED BY ERIE HAMMERS



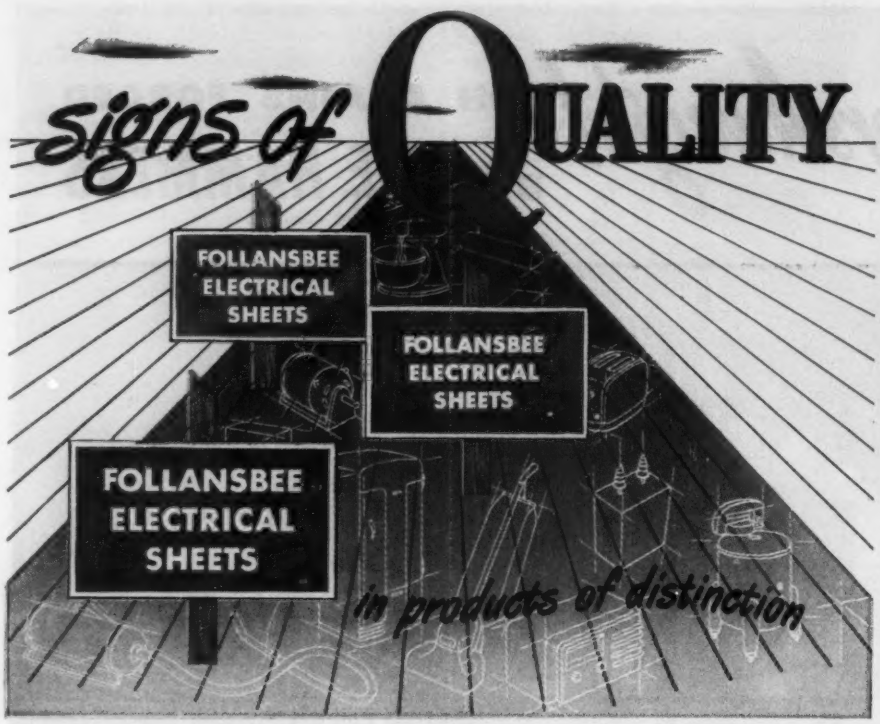
**Lighter, Stronger Anchor chain from mated forgings . . . Unique in forging practice. The Navy Does This Job on Erie Hammers.**

ERIE

Complete Bulletins on Erie Hammers are yours for the asking.

**ERIE FOUNDRY COMPANY • ERIE, PA.**

**ERIE BUILDS *Dependable* HAMMERS**




Strongly linked with the successful products in any market are the quality components, essential in economical manufacturing and profitable marketing—quality components like Follansbee Electrical Sheets.

In Follansbee Electrical Sheets there has never been a departure from the strict electrical and mechanical characteristics which have made the name Follansbee synonymous with *Quality*.

Designers can always specify Follansbee Electrical Sheets with assurance of acceptance by the production engineer, the sales manager, and the ultimate consumer.

Additional supplies are now available and you can incorporate the Follansbee *Signs of Quality* in more and more of your electrical products of distinction. Ask for details on the correct grades for your requirements.

FOLLANSBEE STEEL CORPORATION

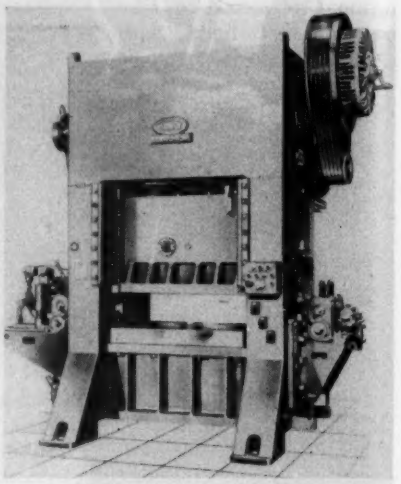
GENERAL OFFICES — PITTSBURGH 30, PA.

COLD ROLLED STRIP • ELECTRICAL SHEETS • POLISHED BLUE SHEETS
SEAMLESS TERNE ROLL ROOFING

*Sales Offices*—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants*—Follansbee, W. Va., and Toronto, O.
★ Follansbee Metal Warehouses — Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn. ★

to 800 tons. Automatic feed of coil and strip stock is used to increase part output.

To suit job requirements, presses may be obtained with direct non-geared crank-drive, single reduction gear eccentric drive and double reduction gear eccentric drive. Press

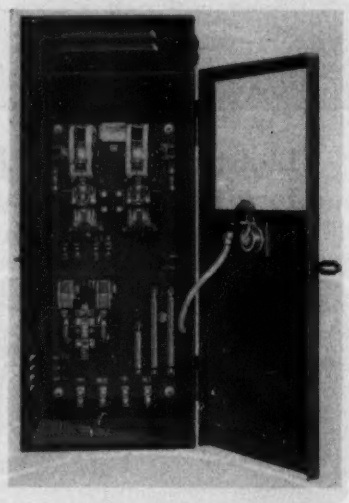


frame components, including base, uprights and crown are made of heavy steel sections, welded and stress relieved. A floating friction block clutch makes it possible to transfer 85 per cent of flywheel momentum to drive shaft upon engagement. Brake is released by an air cylinder which automatically opens the brake when the clutch is released.

Check No. 19 on Reply Card for more Details

## Magnet Controller

For use with large circular lifting magnets and heavy duty rectangular magnets is the DLM-207-A magnet controllers, announced by Electric Controller & Mfg. Co., Cleveland



4, O. The automatic discharge type controller is adjustable to suit size of magnet, material handled and voltage variations up to 10 per cent

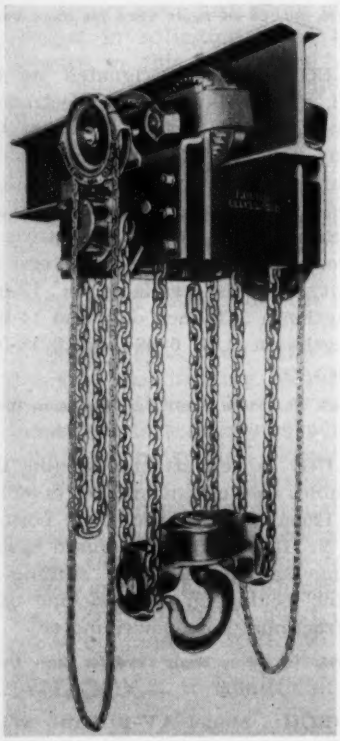
of normal voltage. Adjusting-dial permits the operator to control the opening of the reverse-current contractor for a quick, clean release of the load on the magnet.

A small, two-position master switch mounted in the operator's station controls application of power and de-energization of the magnet. Controller is automatically disconnected from the line after the master switch is moved to the drop position and the load is discharged.

Check No. 20 on Reply Card for more Details

## Trolley Hoists

With its hook raised to maximum height, the shank of Beam-Hugger trolley hoists, built by David Round & Son, Cleveland 5, O., touches the base of the beam. Head room is reduced to the length of the hook only. This construction is said to add



17 to 51 inches more plant working space, depending upon hoist capacity.

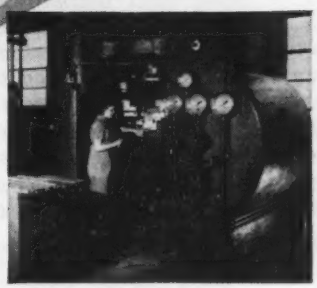
Line of hoists is manufactured in 13 sizes for 1 to 24 ton capacities. Each capacity is available in either plain or geared trolley type. Hoisting machanism is of the David Round Auto-Bloc type which employs two load sheaves with four strands of chain supporting the load.

Check No. 21 on Reply Card for more Details

## Fractional HP Motors

Built with a die cast aluminum frame and suitable for use as drives for fans, blowers and small pumps, are unit bearing, shaded pole frac-

Fansteel
*Tungsten*
*and Molybdenum*



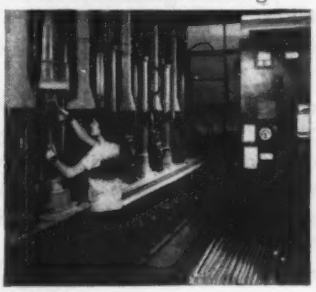
*Fansteel controls every step in metallurgical processing beginning with the ore.*

Tungsten and Molybdenum are two of the most important refractory metals in electrical, electronic and mechanical industries. Their high melting points, low vapor pressure, resistance to arc erosion and great mechanical strength when combined with other metals intensify their values.

Both metals are used for electrical contacts, particularly in automotive ignition, vibrators, telegraph relays. They are components in the Fansteel Fastell® metals wherein their high resistance is combined with the electrical conductivity of silver or copper.

Heating elements in vacuum equipment—electric furnaces of temperatures 1600° C to 2000° C—on electrodes for inert gas welding and many other uses require Tungsten or Molybdenum.

*Tungsten and molybdenum ores are refined to pure metal powder by chemical operations. Powders are compacted to ingots in a powerful hydraulic press. (above). Ingots are sintered in hydrogen atmosphere furnaces by heavy electrical current. (lower picture). Intense heat causes the powder particles to fuse into a strong solid mass without melting.*



Why not investigate Fansteel Metallurgy for better service and possibilities of economy in *your* problems? Fansteel Metallurgical Corporation, North Chicago, Illinois, U.S.A.

**PURE METALS**
**Tantalum, Tungsten, Molybdenum, and Columbium in sheet, rod, wire and special shapes and parts.**

**POWDER METALLURGY PRODUCTS**
**Finished or semi-finished shapes and parts of special analysis to achieve high strength, density, electrical conductivity, resistance to wear, impact, heat erosion, or combinations of these and other properties.**

**COPPER BASE ALLOYS**
**Copper alloyed with other elements, to combine high conductivity with strength, elasticity, resistance to heat, impact, or wear. Available in bars, rod, sheet, strip, castings, forgings, finished or semi-finished parts, for current-carrying springs and other parts, soldering tips, resistance welding electrodes, dies and fixtures.**

11601-B

Fansteel
SPECIAL PRODUCTS
*In Controlled Metallurgy*

tional horsepower motors announced by General Electric Co., Schenectady 5, N. Y. Designated as type KSP71, the motors are available in the following ratings: 1/40 hp, 60/50 cycle, totally enclosed; 1/25 hp, 60 cycle, totally enclosed; and 1/15 hp, 60 cycle, open. All ratings are available for 115 or 230 v and for clockwise or counter clockwise rotation.

Each of the three ratings can be used for horizontal or vertical shaft up operation; each can be obtained with identical outline features. Models are available in a variety of mountings, including shaft-end, opposite shaft-end, and resilient-base. Motors may also be band-mounted.

**Check No. 22 on Reply Card for more Details**

• • •

**VALVES:** A complete line of diaphragm actuated, two pressure Merit valves is available for a wide range of application in high pressure hydraulic service from Emmett Machine & Mfg. Inc., Akron 14, O. Valves range in size from 1 to 4 inches and can be furnished for operation on systems having 3000, 5000 and 10,000 psi pressure.

**Check No. 23 on Reply Card for more Details**

**CORE OILS:** E. F. Houghton & Co., Philadelphia, Pa., announces Hy-Ten 304 core oil. It provides satisfactory strength throughout all sections of all types of cores.

**Check No. 24 on Reply Card for more Details**

**CLEANER:** Penetone Co., Tenafly, N. J., offers Buxite, a cleaner that combines solvent and emulsifying action. It is brushed over entire area and is then hosed off with steam and detergent.

**Check No. 25 on Reply Card for more Details**

**WELD COATING:** Eutecrod 900X is an aluminum alloy used with low heat Eutector flux 900X to join thin aluminum at temperatures below melting point of aluminum. It is available in 3/64-inch and 1/32-inch in coil form from Eutectic Welding Alloys Corp., New York 13, N. Y. It bonds at 900° F and remelts at 950° F; tensile strength is 30,000 psi.

**Check No. 26 on Reply Card for more Details**

**HANGER:** Designed for use with twin or triple unit combinations of mercury and incandescent luminaries, as well as for similar straight incandescent units, series 300 (three-way four wire) disconnecting and lowering hanger facilitates maintenance and repair operations and permits quick changes to meet varying requirements. Rated at 15 amp on 115 v ac and 7.5 amp on 230 v ac, hangers are made by Thompson Electric Co., Cleveland 14, O.

**Check No. 27 on Reply Card for more Details**

**POWER PACK:** A new hydraulic power pack for arbor presses is offered by Anker Holth Mfg. Co., Port Huron, Mich. Using a 1½ hp, 220 v motor, pump develops a maximum of 5000 psi. A 5 gallon reservoir and hose connection are included.

**Check No. 28 on Reply Card for more Details**

**RACK COATING:** Hanson-Van Winkle-Munning Co., Matawan, N. J., announces development of Kote-Rax grade K, a rack coating designed to inculate and protect plating racks and fixtures in all types of electroplating and anodizing solutions. Only two dips are required to obtain a final coating.

**Check No. 29 on Reply Card for more Details**

**LUBRICATOR:** Designated as E-Z greaser, a one hand operated lubricator is offered by K-P Mfg. Co., Minneapolis, Minn., for servicing industrial equipment. It fits any standard 25 to 40 pound original container and requires no tools in installation.

**Check No. 30 on Reply Card for more Details**

**TAP HOLDER:** Tool-flex tap holder, announced by Burg Tool Mfg. Co., Los Angeles 34, Calif., will tap up to 10-24 in steel at ⅞-inch center to center. It features short overhang, shanks to customer specifications, self-centering, oil resistant Neoprene mounting.

**Check No. 31 on Reply Card for more Details**

**FLAME FAILURE SAFEGUARD:** For flame failure protection of semi-automatic and manually ignited industrial oil burners, Combustion Control Corp., Cambridge 42, Mass., introduces Fireye system FF-3. It continuously monitors oil flame and when flame fails, instantly signals control which cuts off fuel supply and sounds an alarm.

**Check No. 32 on Reply Card for more Details**

**"OVER-RIDE" ELIMINATOR —** United Mfg. Co., Bedford, O., introduced recently a new self-contained, hydraulically-operated Titanic surge-control device for use with 11, 12 and 14-inch mechanical brakes on 2 and 4-wheel trailers of the type employed in transporting compressors, generators, concrete mixers, fire-fighting and public utility service equipment. It is said to apply an equal braking action to the towed unit, bringing it to a smooth, positive stop when the towing vehicle slows or stops. Development can be employed with any one of three different hitches—ball and socket, lunette or clevis. It requires no special attachments.

**Check No. 33 on Reply Card for more Details**

**LUBRICANT:** Lubricants Inc., Detroit 2, Mich., offer Esscee Soluble No. 820, a sulphur chlorinated oiliness water soluble, metalworking coolant and lubricant. It may be adapted to the machining of all SAE steels, particularly threading, tapping, broaching, horizontal and vertical of Monel metal, chrome, chrome molybdenum, chrome nickel, tungsten and stainless steels.

**Check No. 34 on Reply Card for more Details**

**ELECTRODE:** Designated as No. 313, a new class E-6013 electrode is announced by Hobart Brothers Co., Troy, O. It is designed for making short, intermittent welds at high speed on all gages of steel in any position using either alternating or direct current, straight or reverse polarity. It is available in 12-inch lengths in 3/32-inch only and 14-inch lengths in 1/8, 5/32 and 3/16-inch sizes.

**Check No. 35 on Reply Card for more Details**

**PLUG:** A new attachment plug that doubles as a circuit breaker is offered by Hopax Electric Inc., New York 13, N. Y. It is designed to guard against dangerous overloading, stalling or rotor locking on any machine using a fractional horsepower motor.

**Check No. 36 on Reply Card for more Details**

**TORCH:** Model AV-10 light weight welding and brazing torch is announced by Liquid Carbonic Corp., Chicago 23, Ill. It is of brazed construction with rear end designed for easy hose connections. It converts into a cutting torch by use of WC-10 cutting attachment.

**Check No. 37 on Reply Card for more Details**

**FOR MORE INFORMATION**
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

# Market Summary

ALTHOUGH users have been making substantial dents in their inventories for some time past in meeting manufacturing requirements, steel stocks in many instances still appear ample in the light of continued shrinkage in consumers' own order backlogs. In some cases, these latter have been virtually wiped out, and in others, they represent but a few months' production at best. In virtually all instances order backlogs in durable goods now stand at levels substantially under those reported earlier.

**STEEL BUYING**— Considering the continued lag in demand for durable goods it is not surprising current steel buying has dropped to lowest ebb since before the war. In certain districts buying of some products is at virtual standstill, with little interest exhibited in nearby requirements, and still less in forward needs. Producers have just about abandoned consumer quotas in soliciting third quarter tonnage. A gesture in this respect is being made in pipe and sheets, especially galvanized sheets, the tightest supply item in the product list today, but, in general, the mills are booking all tonnage offered them where credit ratings are sound. Some producers are losing orders because of f.o.b mill pricing with consumers placing their needs as far as possible with home area mills. They decline to pay freight charges formerly absorbed by mills under the basing point system.

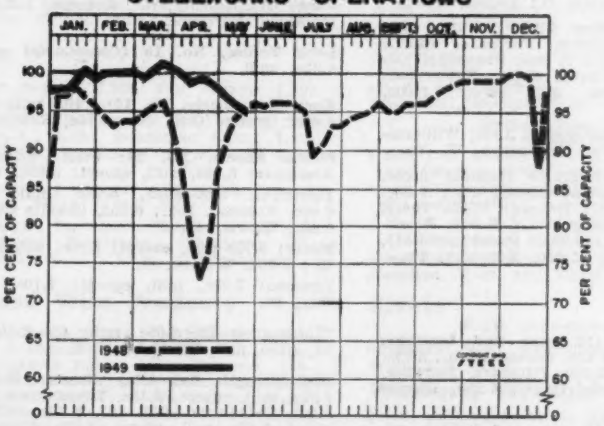
**SHIPMENTS**— Lead time on shipments appears to be shrinking. While most products are not stocked the mills now are offering some remarkably fast deliveries where consumer pressure is strong enough. Some quick deliveries are made possible by diversion of canceled or deferred tonnage, or through accumulation of overages in a diversified assortment. At the same time, with rolling facilities no longer taxed, and, in fact, with mill operations declining, some unusually good deliveries are being made on tonnage rolled to specification.

**OUTLOOK**— It is difficult to assess the outlook beyond end of current quarter in view of the uncertainties in general business. With buyers displaying extreme caution in ordering ahead there seems every chance mill backlogs will continue to shrink. For some time past producers have been drawing on order accumulations to support high steelmaking operations. This cannot continue indefinitely. Further, the outlook for the immediate future is blurred by the threat of labor trouble. Currently, strike at Ford plants is exerting an increasingly adverse influence as Ford suppliers curtail operations. The possibility of a coal strike has stimulated some buying of coal for stockpiles over the past week or two, and this threat probably is accounting for some steel buying. In the main, however, this stimulant to buying does not appear to be much of a factor.

**PRICES**— Here and there downward adjustments in premium prices continue. Producers generally have adjusted galvanized products to reflect recent reductions in the price of zinc. Last week the warehouses were effecting similar revisions. Otherwise, the price situation was featureless. In the trade the view is widespread lower steel prices are on the way. Some consumers anticipate a reduction in pig iron quotations with demand continuing to lag and scrap prices still tending toward lower levels. In the main, however, it is thought steel price changes of major import are unlikely until forthcoming steel wage negotiations are disposed of. Issuance of revised extra cards, incorporating both increases and decreases on a broad list of products, continues deferred by U. S. Steel subsidiaries. Other producers are not likely to act on extras until the leading interest moves.

**COMPOSITES**— Scrap continues to display a weak price tone. STEEL's composite on steelmaking grades last week eased to $21.67 from $22.25 the preceding week and compared with $40.67 in the like week a year ago. Other composites held unchanged last week.

## STEELWORKS OPERATIONS




## DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

| | Week Ended May 21 | Change | Same Week 1948 | Same Week 1947 |
|---|---|---|---|---|
| Pittsburgh | 94 | — 1* | 96 | 103 |
| Chicago | 99.5 | None | 93.5 | 94.5 |
| Eastern Pa. | 92 | — 0.5 | 88 | 91.5 |
| Youngstown | 105 | None | 103 | 93 |
| Wheeling | 84 | — 4 | 97.5 | 93.5 |
| Cleveland | 101 | + 0.5 | 96.5 | 91 |
| Buffalo | 97.5 | None* | 93. | 86 |
| Birmingham | 100 | None | 100 | 99 |
| New England | 66 | None | 79 | 95 |
| Cincinnati | 96 | — 5 | 106 | 94 |
| St. Louis | 75.5 | None | 84 | 68.5 |
| Detroit | 70 | + 1 | 100 | 93 |
| Western | 92 | — 1 | .. | .. |
| Estimated national rate | 95 | — 0.5 | 95 | 96.5 |

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. * Revised.

# COMPOSITE MARKET AVERAGES

## Arithmetical Price Composites*

| | May 21 | May 14 | Month Ago Apr. 1949 | Year Ago May 1948 | 5 Years Ago May 1944 |
|---|---|---|---|---|---|
| Finished Steel | $93.55 | $93.55 | $94.48 | $80.27 | $56.73 |
| Semifinished Steel | 66.72 | 66.72 | 68.45 | 68.62 | 36.00 |
| Steelmaking Pig Iron | 45.60 | 45.60 | 46.16 | 39.66 | 23.00 |
| Steelmaking Scrap | 21.67 | 22.25 | 24.06 | 40.67 | 19.17 |

**FINISHED STEEL WEIGHTED COMPOSITE†**

| | |
|---|---|
| Apr. 1949 | 4.02714c |
| Mar. 1949 | 4.05098c |
| Feb. 1949 | 4.06149c |
| Apr. 1948 | 3.62766c |
| Apr. 1944 | 2.43493c |

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. April, 1949, figure is preliminary.

# COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

## Finished Materials

| | May 21, 1949 | Apr. 1949 | Feb. 1949 | May 1948 |
|---|---|---|---|---|
| Steel bars, Pittsburgh mills | 3.35c | 3.35c | 3.45c | 2.875c |
| Steel bars, del. Philadelphia | 3.8164 | 3.8164 | 3.8164 | 3.365 |
| Steel bars, Chicago mills | 3.35 | 3.35 | 3.35 | 2.875 |
| Shapes, Pittsburgh mills | 3.25 | 3.25 | 3.275 | 2.775 |
| Shapes, Chicago mills | 3.25 | 3.25 | 3.25 | 2.775 |
| Shapes, del. Philadelphia | 3.4918 | 3.4918 | 3.48 | 2.98 |
| Plates, Pittsburgh mills | 3.40 | 3.50 | 3.50 | 2.925 |
| Plates, Chicago mills | 3.40 | 3.40 | 3.40 | 2.925 |
| Plates, del. Philadelphia | 3.6348 | 3.6348 | 3.7256 | 3.21 |
| Sheets, hot-rolled, Pittsburgh mills | 3.25 | 3.26 | 3.275 | 2.775 |
| Sheets, cold-rolled, Pittsburgh | 4.00 | 4.00 | 4.00 | 3.50 |
| Sheets, No. 10 galv., Pittsburgh | 4.40 | 4.40 | 4.40 | 3.90 |
| Sheets, hot-rolled, Gary mills | 3.25 | 3.25 | 3.25 | 2.775 |
| Sheets, cold-rolled, Gary mills | 4.00 | 4.00 | 4.00 | 3.50 |
| Sheets, No. 10 galv., Gary mills | 4.40 | 4.40 | 4.40 | 3.90 |
| Strip, hot-rolled, Pittsburgh mills | 3.275 | 3.50 | 3.275 | 3.05 |
| Strip, cold-rolled, Pittsburgh mills | 4.375 | 4.375 | 4.375 | 3.775 |
| Bright basic, wire, Pittsburgh | 4.15 | 4.15 | 4.325 | 3.725 |
| Wire nails, Pittsburgh mills | 5.15 | 5.15 | 5.775 | 5.125 |
| Tin plate, per base box, Pitts. dist. | $7.75† | $7.75† | $7.75† | $6.80 |

## Semifinished

| | | | | |
|---|---|---|---|---|
| Sheet bars, mill | $67.00* | $67.00* | $67.00* | $60.00 |
| Slabs, Chicago | 52.00 | 52.00 | 52.00 | 45.00 |
| Rerolling billets, Pittsburgh | 52.00 | 52.00 | 59.00 | 45.00 |
| Wire rod 7/32 to ¼-inch, Pitts. dist. | 3.775c | 3.775c | 3.775c | 3.175c |

* Nominal. † 1.50 lb coating.

## Pig Iron

| | May 21, 1949 | Apr. 1949 | Feb. 1949 | May 1948 |
|---|---|---|---|---|
| Bessemer, del. Pittsburgh (N.&S. sides) | $48.08 | $48.08 | $48.08 | $41.038 |
| Basic, Valley | 46.00 | 46.00 | 46.00 | 39.00 |
| Basic, eastern, del. Philadelphia | 49.39 | 49.6175 | 50.3002 | 42.17 |
| No. 2 fdry., del. Pgh. (N.&S. sides) | 47.58 | 47.58 | 47.58 | 40.538 |
| No. 2 fdry., del. Philadelphia | 49.89 | 50.1175 | 50.8002 | 42.67 |
| No. 2 foundry, Chicago | 46.25 | 46.25 | 46.25 | 39.00 |
| No. 2 foundry, Valley | 46.50 | 46.50 | 46.50 | 39.50 |
| Southern No. 2 Birmingham | 39.38 | 43.38 | 43.38 | 38.63 |
| Southern No. 2 del. Cincinnati | 45.43 | 49.43 | 49.43 | 43.90 |
| Malleable, Valley | 46.50 | 46.50 | 46.50 | 39.50 |
| Malleable, Chicago | 46.50 | 46.50 | 46.50 | 39.50 |
| Charcoal, low phos., fob Lyles, Tenn. | 66.00 | 66.00 | 66.00 | 56.50 |
| Ferromanganese, f.o.b. Etna, Pa. | 175.00 | 175.00 | 163.00 | 151.00* |

* F.o.b. cars Pittsburgh.

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melt. steel, No. 1, Pittsburgh | $23.00 | $25.12 | $40.00 | $40.25 |
| Heavy melt. steel, No. 2, E. Pa. | 19.25 | 20.69 | 35.69 | 39.00 |
| Heavy melt. steel, No. 1, Chicago | 20.50 | 23.75 | 35.75 | 39.25 |
| Heavy melt. steel, No. 1 Valley | 22.00 | 22.75 | 37.75 | 40.25 |
| Heavy melt. steel, No. 1 Cleveland | 18.50 | 20.38 | 37.25 | 39.75 |
| Heavy melt. steel, No. 1, Buffalo | 22.25 | 24.38 | 40.50 | 43.00 |
| Rails for rerolling, Chicago | 27.75 | 31.31 | 48.19 | 51.75 |
| No. 1 cast, Chicago | 27.50 | 30.25 | 44.25 | 69.00 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, beehive furnace | $14.25 | $14.44 | $14.50 | $12.94 |
| Connellsville, beehive foundry | 16.75 | 17.00 | 17.00 | 15.06 |
| Chicago, oven foundry, ovens | 20.40 | 20.40 | 20.40 | 19.50 |

# FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

## Semifinished Steel

**Carbon Steel Ingots:** Rerolling quality, standard analysis, open market, $80-$85 per gross ton. Forging quality, $50 per net ton, mill.

**Alloy Steel Ingots:** $51 per net ton, mill.

**Rerolling Billets, Blooms, Slabs:** $52 per net ton, mill, except: $57, Conshohocken, Pa.

**Forging Quality Billets, Blooms, Slabs:** $61 per net ton, mill, except: $63, Conshohocken, Pa., mill.

**Alloy Billets, Slabs, Blooms:** Rerolling quality, $63 per net ton, mill except: $65, Conshohocken, Pa.

**Sheet Bars:** $67 nom., per net ton, mill; sales in open market $65-$75 per gross ton.

**Skelp:** 3.25c per lb, mill.

**Tube Rounds:** $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

**Wire Rods:** Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles; 4.15c Monessen, Pa. Basic open-hearth and bessemer, 7/23 to 47/64-in., inclusive, 3.50c, Sparows Point, Md.

## Bars

**Hot-Rolled Carbon Bars (O.H. only; base 20 tons):** 3.35c, mill, except: 3.55c, Ecorse, Mich.; 4.00c Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 4.40c, Atlanta.

**Rail Steel Bars: (Base 10 tons):** 3.35c Huntington, W. Va., and Moline, Ill.; 4.00c, Williamsport, Pa.

**Hot-Rolled Alloy Bars:** 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

**Cold-Finished Carbon Bars (Base 40,000 lb and over):** 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.50c, Camden, N. J.; 5.40c, Los Angeles.

**Cold-Finished Alloy Bars:** 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

**High-Strength, Low-Alloy Bars:** 5.10c, mill, except: 5.30c, Struthers, O., Ecorse, Mich.

**Reinforcing Bars (New Billet):** 3.35c, mill, except: 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

**Reinforcing Bars (Rail Steel):** 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

**Wrought Iron Bars:** Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

## Sheets

**Hot-Rolled Sheets (18 gage and heavier):** 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.75c, Conshohocken, Pa.; 3.95c, Pittsburg, Torrance, Calif.; 4.15c, Fontana, Calif.; 6.25c, Kansas City, Mo.

**Hot-Rolled Sheets (19 gage and lighter, annealed):** 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.05c, Torrance Calif.; 5.25c, Kokomo, Ind.

**Cold-Rolled Sheets:** 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.95c, Pittsburg, Calif.

**Galvanized Sheets, No. 10:** (Based on 5 cent zinc) 4.40c, mill, except: 4.80c, Kokomo, Ind.; 5.15c, Pittsburgh, Torrance, Calif.

**Galvannealed Sheets:** 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.30c, Kokomo, Ind.

**Culvert Sheets, No. 16 flat Copper Steel** (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

**Long Ternes, No. 10 (Commercial quality):** 4.80c, mill.

**Enameling Sheets, No. 12:** 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.

**Silicon Sheets, No. 24: Field:** 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren. Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.

Motor: 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.

Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill, 58, 9.30c, mill, 52, 10.10c, mill.

**High-Strength Low-Alloy Sheets:** Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown, Ecorse, Mich. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown, Ecorse, Mich.

## Strip

**Hot-Rolled Strip:** 3.25c mill, except: 3.30c, Cleveland; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Atlanta; 4.00c, Pittsburg, Torrance, Calif.; 4.20c, Kansas City, Mo.; 4.25c, Seattle, San Francisco, Los Angeles; 4.30c, Minnequa, Colo.; 4.65c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

**Cold-Rolled Strip** (0.25 carbon and less); 4.00c, mill, except: 4.00-4.25c, Warren, O.; 4.00-4.50c, New Castle, Pa., Youngstown; 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.40-4.50c, Detroit; 4.50c New Haven, Conn., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N.J.; 4.85c, Wallingford, Conn.; 5.55c, Fontana, Calif.; 5.75c, Los Angeles. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

**Cold-Finished Spring Steel:** 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.25-4.50c, New Castle, Pa., Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

**Cold-Rolled Alloy Strip:** 9.50c, mill except: 9.80c, Worcester, Mass.

**High-Strength, Low-Alloy Strip:** Hot-rolled, 4.95c, mill, except: 5.15c, Struthers, O., Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown, Ecorse, Mich., mill.

## Tin, Terne, Plate

**Tin Plate:** American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

**Electrolytic Tin Plate:** Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

**Can Making Black Plate:** Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

**Holloware Enameling Black Plate:** 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

**Manufacturing Ternes (Special Coated):** Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

**Roofing Ternes:** Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $15.50.

## Plates

**Carbon Steel Plates:** 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.50c, Coatesville, Pa.; 3.55c, Conshohocken, Pa.; 3.65c, Claymont, Del., Ecorse, Mich.; 3.95c, Harrisburg, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston; 4.35c, Fontana, Calif.; 6.25c, Kansas City, Mo.

**Floor Plates:** 4.55c, mill.

**Open-Hearth Alloy Plates:** 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

**High-Strength, Low-Alloy Plates:** 5.20c mill, except: 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.45c, Ecorse, Mich.; 5.65c, Sharon, Pa.

## Shapes

**Structural Shapes:** 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.75c, Phoenixville, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 3.80c, Fontana, Calif.

**Alloy Structural Shapes:** 4.05c, mill.

**Steel Sheet Piling:** 4.05c, mill.

**High-Strength, Low-Alloy Shapes:** 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Struthers, O.

## Wire and Wire Products

**Wire to Manufacturers (carloads):** Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Minnequa, Colo., Atlanta, Buffalo; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco. One producer quotes 4.15c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

**Basic MB Spring Wire,** 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

**Upholstery Spring Wire,** 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa., Portsmouth, O.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

**Wire Products to Trade (carloads): Merchant Quality Wire: Annealed** (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.20c, Atlanta; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

**Galvanized** (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

**Nails and Staples:** Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 109, Worcester, Mass.; 110, Minnequa, Colo., Atlanta, Cleveland; 123, Pittsburg, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

**Woven Fence** (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Portsmouth, O., Kokomo, Ind.; 116, Minnequa, Colo.; 121, Atlanta; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

**Barbed Wire:** Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 126 Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

**Fence Posts (with clamps):** Col. 114, Duluth; 116, Moline, Ill.; 122, Minnequa, Colo.; 125, Johnstown, Pa.; $120 per net ton, Williamsport, Pa.

**Bale Ties (single loop):** Col. 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 110, Atlanta; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

## Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

**Carriage and Machine Bolts**

| | |
|---|---|
| ½-in. and smaller; up to 6 in. in length | 35 off |
| ⅝ and ⅝ x 6-in. and shorter | 37 off |
| ⅝-in. and larger x 6-in. and shorter | 34 off |
| All diameters longer than 6-in. | 30 off |
| Tire bolts | 25 off |
| Plow bolts | 47 off |
| Lag bolts, 6 in. and shorter | 37 off |
| Lag bolts, longer than 6 in. | 35 off |

**Stove Bolts**

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

**Nuts**

| Semifinished hexagon | A.S. Light | A.S. Reg. and Heavy |
|---|---|---|
| ⅞-in. and smaller | 41 off | ..... |
| ½-in. and smaller | ..... | 38 off. |
| ⅝-in.-1-in. | 39 off | ..... |
| ⅞-in.-1-in. | ..... | 37 off |
| 1⅛-in.-1¼-in. | 37 off | 35 off |
| 1⅜-in. and larger | 34 off | 28 off |

Additional discount of 15 for full containers.

**Hexagon Cap Screws (Packaged)**

| | |
|---|---|
| Upset 1-in. smaller by 6-in. and shorter (1020 bright) | 46 off |
| Upset (1035 heat treated) | |
| ⅝ and smaller x 6 and shorter | 40 off |
| ¾, ⅞, & 1 x 6-in. and shorter | 35 off |

**Square Head Set Screws**

| | |
|---|---|
| Upset 1-in. and smaller | 51 off |
| Headless, ¼-in. and larger | 31 off |

## Rivets

F.o.b. midwestern plants

| | |
|---|---|
| Structural ½-in. and larger | 6.75c |
| ⅞-in. and under | 48 off |

## Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

*For prices of stainless and tool steels please refer to May 9 issue, Page 153.*

## Tubular Goods

**Standard Steel Pipe:** Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton. Discounts from base follow:

| | Butt Weld | | | Butt Weld | |
|---|---|---|---|---|---|
| In. | Blk. | Gal. | In. | Blk. | Gal. |
| ⅛..... | 39½– | 13– | 1..... | 46½– | 30– |
| | 41½ | 13½ | | 48½ | 32½ |
| ¼..... | 37½– | 14½– | 1¼.... | 47– | 30½– |
| | 39½ | 15 | | 49 | 33 |
| ⅜..... | 34– | 9½– | 1½.... | 47½– | 31– |
| | 36 | 11½ | | 49½ | 33½ |
| ½..... | 41– | 23– | 2..... | 48– | 31½– |
| | 43 | 25½ | | 50 | 34 |
| ¾..... | 44– | 27– | 2½, 3.. | 48½– | 32– |
| | 46 | 29½ | | 50½ | 34½ |
| | | | 3½ & 4. | 44½ | 28 |

| | Lap Weld | | Elec. Weld | | Seamless | |
|---|---|---|---|---|---|---|
| In. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| 2.... | 40½ | 24 | 38½ | 22 | 28– | 11½– |
| | | | | | 38½ | 22 |
| 2½.. | 44½ | 28 | 41½ | 25 | 33½– | 17– |
| | | | | | 41½ | 25 |
| 3.... | 44½ | 28 | 41½ | 25 | 36– | 19½– |
| | | | | | 41½ | 25 |
| 3½&4 | 42½– | 25– | 43½ | 27 | 38½– | 22– |
| | 46½ | 30 | | | 43½ | 27 |
| 5 & 6. | 42½– | 25– | 43½ | 27 | 43½ | 27 |
| | 44½ | 28 | | | | |
| 7.... | .... | .... | .... | .... | 43½ | 26 |

**Line Steel Pipe:** Mill prices in carlots to consumers about $200 a net ton.

| | Butt Weld | | | Butt Weld | |
|---|---|---|---|---|---|
| In. | Blk. | Gal. | In. | Blk. | Gal. |
| ⅛..... | 40½ | 11½ | 1¼.... | 46– | 31– |
| ¼..... | 38½ | 13½ | | 48 | 32 |
| ⅜..... | 35 | 9½ | 1½.... | 46½– | 31½– |
| ½..... | 40– | 23½– | | 48½ | 32½ |
| | 42 | 24½ | 2..... | 47– | 32– |
| ¾..... | 43– | 27½– | | 49 | 33 |
| | 45 | 28½ | 2½ & 3 | 47½– | 32½– |
| 1..... | 45½– | 30½– | | 49½ | 33½ |
| | 47½ | 31½ | 3½ & 4. | 43½ | 27 |

| | Lap Weld | | Elec. Weld | | Seamless | |
|---|---|---|---|---|---|---|
| In. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| 2.... | 39½ | 23 | 37½ | 21 | 27– | 10½– |
| | | | | | 37½ | 21 |
| 2½.. | 43½ | 27 | 40½ | 24 | 32½– | 16– |
| | | | | | 40½ | 24 |
| 3.... | 43½ | 27 | 40½ | 24 | 35– | 18½– |
| | | | | | 40½ | 24 |
| 3½-4 | 41½– | 27½– | 42½ | 26 | 37½– | 21– |
| | 45½ | 29 | | | 42½ | 26 |
| 5 & 6. | 41½– | 27– | 42½ | 26 | 42½ | 26 |
| | 43½ | 27½ | | | | |
| 8.... | 45½ | 28 | 44½ | 27 | 44½ | 27 |
| | | | | 24 | | |
| 10... | 45 | 27½ | 44 | 26½ | 44 | 26½ |
| 12... | 44 | 26½ | 43 | 25½ | 43 | 25½ |

**Standard Wrought Iron Pipe:** Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

| | Butt Weld | | | Lap Weld | |
|---|---|---|---|---|---|
| In. | Blk. | Gal. | In. | Blk. | Gal. |
| ⅜... | +59 | +90½ | 1¼.. | +22 | +47½ |
| ½... | +20 | +47½ | 1½.. | +15½ | +40 |
| ¾... | +10 | +36½ | 2.... | + 7½ | +31 |
| 1 and | | | 2½-3 | + 5 | +26½ |
| 1¼ | + 4 | +27½ | 4.... | List | +20½ |
| 1½.. | — 2 | +24 | 4½-8 | + 2 | +22 |
| 2.... | — 2½ | +23½ | 9-12. | +12 | +31½ |

**Boiler Tubes:** Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

| O.D. | B.W. | Seamless | | Elec. Weld | |
|---|---|---|---|---|---|
| In. | Ga. | H.R. | C.D. | H.R. | C.D. |
| 1 | 13 | ..... | 13.39-14.64 | 13.00 | 13.00 |
| 1¼ | 13 | ..... | 15.87-17.34 | 13.21 | 15.39 |
| 1½ | 13 | 16.45 | 17.71-19.35 | 14.60 | 17.18 |
| 1¾ | 13 | 18.71 | 20.15-22.02 | 16.60 | 19.54 |
| 2 | 13 | 20.96 | 22.56-24.66 | 18.60 | 21.89 |
| 2¼ | 13 | 23.36 | 25.16-27.50 | 20.73 | 24.40 |
| 2¼ | 12 | 23.54-25.73 | 27.70-30.28 | 22.83 | 26.88 |
| 2½ | 12 | 25.79-28.19 | 30.33-33.15 | 25.02 | 29.41 |
| 2¾ | 12 | 27.33-29.87 | 32.14-35.13 | 26.51 | 31.18 |
| 3 | 12 | 28.68-31.35 | 33.76-36.90 | 27.82 | 32.74 |
| 3¼ | 11 | 33.39-36.50 | 39.29-42.95 | 32.39 | 38.11 |
| 3½ | 11 | 35.85-39.19 | 42.20-46.13 | 34.78 | 40.94 |
| 4 | 10 | 44.51-48.65 | 52.35-57.22 | 43.17 | 50.78 |
| 4½ | 9 | 58.99-64.47 | 69.42-75.88 | .... | .... |
| 5 | 9 | 68.28-74.64 | 80.35-87.82 | .... | .... |
| 6 | 7 | 104.82-114.57 | 123.33-134.81 | .... | .... |

**Pipe Cast Iron:** Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

## Rails, Supplies

**Rails:** Standard, over 60-lb; $3.20 per 100 lb mill, except: $3.30, Minnequa, Colo.

**Light (billet):** $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

**Light (rail steel):** $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.

**Railroad Supplies:** Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

**Tie Plates:** 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

**Splice Bars:** 4.25c, mill.

**Standard Spikes:** 5.35c, mill.

**Axles:** 5.20c, mill.

# RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

## Pig Iron

Per Gross Ton

| | Basic | No. 2 Foundry | Malleable | Bessemer |
|---|---|---|---|---|
| **Bethlehem, Pa.,** furnace | $48.00 | $48.50 | $49.00 | $49.50 |
| Newark, N. J., del. | 50.5334 | 51.0334 | 51.5334 | 52.0334 |
| Brooklyn, N. Y., del. | .... | 52.634 | 53.134 | .... |
| **Birmingham,** furnace | 38.88 | 39.38 | .... | .... |
| Cincinnati, del. | .... | 45.43 | .... | .... |
| **Buffalo,** furnace | 46.00 | 46.50 | 47.00 | .... |
| Boston, del. | 54.92 | 55.42 | 55.92 | .... |
| Rochester, del. | 47.95 | 48.45 | 48.95 | .... |
| Syracuse, del. | 49.39 | 49.89 | 50.39 | .... |
| §**Chicago,** district furnaces | 46.00 | 46.00-46.50 | 46.50 | 47.00 |
| Milwaukee, del. | 47.82 | 47.82-48.32 | 48.32 | 48.82 |
| Muskegon, Mich., del. | .... | 51.28-51.78 | 51.78 | .... |
| **Cleveland,** furnace | 46.00 | 46.50 | 46.50 | 47.00 |
| Akron, del. | 48.3002 | 48.8002 | 48.8002 | 49.3002 |
| **Duluth,** furnace | .... | 46.50 | 46.50 | 47.00 |
| **Erie, Pa.,** furnace | 46.00 | 46.50 | 46.50 | 47.00 |
| **Everett, Mass.,** furnace | .... | 52.50 | 53.00 | .... |
| **Geneva, Utah,** furnace | 46.00 | 46.50 | .... | .... |
| Seattle, Tacoma, Wash., del. | .... | 54.0578 | .... | .... |
| Portland, Oreg., del. | .... | 54.0578 | .... | .... |
| Los Angeles, San Francisco | 53.5578 | 54.0578 | .... | .... |
| **Granite City, Ill.,** furnace | 47.90 | 48.40 | 48.90 | .... |
| St. Louis, del. | 49.40 | 49.90 | 50.40 | .... |
| **Ironton, Utah,** furnace | 47.00 | 47.50 | .... | .... |
| **Lone Star, Tex.,** furnace | 46.00 | †46.50 | .... | .... |
| Gulf ports, del. | 50.50 | 51.00 | .... | .... |
| ‡**Neville Island, Pa.,** furnace | 46.00 | 46.50 | 46.50 | 47.00 |
| Pittsburgh, del., N.&S. Sides | 47.08 | 47.58 | 47.58 | 48.08 |
| **Pittsburgh (Carnegie),** furnaces | 46.00 | .... | .... | 47.00 |
| **Sharpsville, Pa.,** furnace | 46.00 | 46.50 | 46.50 | 47.00 |
| **Steelton, Pa.,** furnace | 48.00 | 48.50 | 49.00 | 49.50 |
| **Struthers, O.,** furnace | 46.00 | .... | .... | .... |
| **Swedeland, Pa.,** furnace | 48.00 | 48.50 | 49.00 | 49.50 |
| Philadelphia, del. | 49.39 | 49.89 | 50.39 | 50.89 |
| **Toledo, O.,** furnace | 46.00 | 46.50 | 46.50 | 47.00 |
| Cincinnati, del. | 50.8230 | 51.3230 | .... | .... |
| **Troy, N. Y.,** furnace | 48.00 | 48.50 | 49.00 | .... |
| **Youngstown, O.,** furnace | 46.00 | 46.50 | 46.50 | 47.00 |
| Mansfield, O., del. | 50.1022 | 50.6022 | 50.6022 | 51.1022 |

† Low phosphorus southern grade.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

**Blast Furnace Silvery Pig Iron**

6.00-6.50 per cent Si (base)..$59.50
6.51-7.00.. 60.50 9.01- 9.50. 65.50
7.01-7.50.. 61.50 9.51-10.00. 66.50
7.51-8.00.. 62.50 10.01-10.50. 67.50
8.01-8.50.. 63.50 10.51-11.00. 68.50
8.51-9.00.. 64.50 11.01-11.50. 69.50

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

**Bessemer Ferrosilicon**

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

**Electric Furnace Silvery Pig Iron** Si 14.01-14.50%, $78.50 furnace, Niagara Falls; $80 open-hearth and foundry grade, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area. 12½ lb piglets, $85, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

**Charcoal Pig Iron**

Semi-cold blast, low phosphorous. F.o.b. furnace, Lyles, Tenn....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

**Low Phosphorus**

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central furnace, Cleveland, $51.

## Electrodes

(Threaded, with nipples, unboxed)

| Diam. (Inches) | Length | Cents per lb. f.o.b. plant |
|---|---|---|
| | Graphite | |
| 17, 18, 20 | 60, 72 | 16.00 |
| 8 to 16 | 48, 60, 72 | 16.50 |
| 7 | 48, 60 | 17.75 |
| 8 | 48, 60 | 19.00 |
| 4, 5⅛ | 40 | 19.50 |
| 3 | 40 | 20.50 |
| 2½ | 24, 30 | 21.00 |
| 2 | 24, 30 | 23.00 |
| | Carbon | |
| 40 | 100, 110 | 7.50 |
| 35 | 100, 110 | 7.50 |
| 30 | 84, 110 | 7.50 |
| 24 | 72 to 104 | 7.50 |
| 17 to 20 | 84, 90 | 7.50 |
| 14 | 60, 72 | 8.00 |
| 10, 12 | 60 | 8.25 |
| 8 | 60 | 8.50 |

## Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective $CaF_2$ content, 70% or more, $37; less than 60%, $34.

## Metallurgical Coke

Price per Net Ton

**Beehive Ovens**

| | |
|---|---|
| Connellsville, furnace.. | $13.50-15.00 |
| Connellsville, foundry.. | 16.00-17.50 |
| New River, foundry | 16.50 |
| Wise county, foundry.. | 15.35 |
| Wise county, furnace.. | 14.60 |

**Oven Foundry Coke**

| | |
|---|---|
| **Kearney, N. J.,** ovens. | $22.00 |
| **Everett, Mass.,** ovens. New England, del.‡. | 22.70 |
| **Chicago,** ovens | 20.40 |
| Chicago, del. | †21.85 |
| Detroit, del. | 24.16 |
| **Terre Haute,** ovens | 20.20 |
| **Milwaukee,** ovens | 21.15 |
| **Indianapolis,** ovens | 19.85 |
| Chicago, del. | 23.19 |
| Cincinnati, del. | 22.66 |
| Detroit, del. | 23.61 |
| **Ironton, O.,** ovens | 19.40 |
| Cincinnati, del. | 21.63 |
| **Painesville, O.,** ovens.. | 20.90 |
| Buffalo, del. | 23.42 |
| Cleveland, del. | 22.55 |
| Erie, del. | 22.70 |
| **Birmingham,** ovens | 17.70 |
| **Philadelphia,** ovens | 20.45 |
| **Swedeland, Pa.,** ovens. | 20.40 |
| **Portsmouth, O.,** ovens. | 19.50 |
| **Detroit,** ovens | 20.65 |
| Detroit, del. | *21.70 |
| Buffalo, del. | 22.75 |
| Flint, del. | 22.98 |
| Pontiac, del. | 21.98 |
| Saginaw, del. | 23.30 |

Includes representative switching charge of: *, $1.05; †, $1.45. ‡Or within $4.03 freight zone from works.

## Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

| | |
|---|---|
| Pure benzol | 20.00 |
| Toluol, one degree | 19.00-23.50 |
| Industrial xylol | 20.50-26.50 |

Per ton bulk, ovens

| | |
|---|---|
| Sulphate of ammonia | $45.00 |

Per pound, ovens (Effective as of Oct. 1)

| | |
|---|---|
| Phenol, 40 (carlots, returnable drums) | 13.50 |
| Do., less than carlots | 14.25 |
| Do., tank cars | 12.50 |

(Effective as of Oct. 25)

| | |
|---|---|
| Naphthalene flakes, balls, bbl to jobbers, "household use" | 13.75 |

## Refractories

(Prices per 1000 brick, f.o.b. plant)

**Fire Clay Brick**

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

**Ladle Brick**

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

**Malleable Bung Brick**

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

**Silica Brick**

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

**Basic Brick**

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.) Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

**Magnesite**

(Base prices per net ton, f.o.b. works, Chewelah, Wash.) Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

**Dolomite**

(Base prices per net ton) Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores ....

## Ores

**Lake Superior Iron Ore**

*Gross ton, 51½% (natural) Lower Lake Ports*

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

| | |
|---|---|
| Old range bessemer | $7.60 |
| Old range nonbessemer | 7.45 |
| Mesabi bessemer | 7.35 |
| Mesabi nonbessemer | 7.20 |
| High phosphorus | 7.20 |

**Eastern Local Ore**

*Cents, units, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56.62% concentrates, contract | 16.00 |

**Foreign Ore**

*Cents per unit, c.i.f. Atlantic ports*

| | |
|---|---|
| Swedish basic, 60 to 68%: Spot | 17.00 |
| Long-term contract | 15.00 |
| Brazil iron ore, 68-69% | 19.50 |

**Tungsten Ore**

| | |
|---|---|
| Wolframite and scheelite per short ton unit, duty paid | $26–$28 |

**Manganese Ore**

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

**Chrome Ore**

*Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)*

| | |
|---|---|
| Indian and African 48% 2.8:1 | 37.50 |
| 48% 3:1 | 39.00 |
| 48% no ratio | 31.00 |
| South African (Transvaal) 44% no ratio | $25.50-$26.00 |
| 45% no ratio | 26.50 |
| 48% no ratio | 29.00-30.00 |
| 50% no ratio | 29.50-30.50 |
| Brazilian—nominal 44% 2.5:1 lump | $33.65 |
| Rhodesian 45% no ratio | $27-$27.50 |
| 48% no ratio | 30.00 |
| 48% 3:1 lump | 39.00 |
| Domestic (seller's nearest rail) 48% 3:1 | $39.00 |

**Molybdenum**

| | |
|---|---|
| Sulphide conc., lb, Mo., cont., Mines | $0.90 |

# WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras

| | SHEETS | | | STRIP | | BARS | | | | PLATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | H-R 10 Ga. | C-R 17 Ga. | Gal. *18 Ga. | †H-R | †C-R | H-R Rds. ⅝" to 3" | C-F Rds. ½" & up | H-R Alloy **4140 | Standard Structural Shapes | Carbon ⅜"-¾" | Floor ¾" & Thicker |
| New York (city) | 6.00 | 6.51‡ | 7.20 | 5.82 | ... | 5.77 | 6.56 | 8.68 | 5.53 | 5.90 | 7.36 |
| New York(c'try) | 5.80 | 6.31‡ | 7.00 | 5.62 | ... | 5.57 | 6.36 | 8.48 | 5.33 | 5.70 | 7.16 |
| Boston (city) .. | 6.10 | 6.70 | 7.21 | 5.80 | ... | 5.67 | 6.42 | 8.72 | 5.57 | 5.95 | 7.40 |
| Boston (c'try).. | 5.95 | 6.55 | 7.06 | 5.65 | ... | 5.52 | 6.27 | 8.57 | 5.42 | 5.80 | 7.25 |
| Phila. (city)... | 5.72 | 6.64 | 6.88 | 5.60 | ... | 5.55 | 6.34 | 8.40 | 5.25 | 5.53 | 6.74 |
| Phila. (c'try)... | 5.57 | 6.59 | 6.73 | 5.45 | ... | 5.40 | ... | 8.25 | 5.10 | 5.38 | 6.59 |
| Balt. (city) ... | 5.46† | 6.36‡ | 6.96 | 5.52 | ... | 5.57 | 6.31 | ... | 5.51 | 5.71 | 7.16 |
| Balt. (c'try)... | 5.31† | 6.21‡ | 5.81 | 5.37 | ... | 5.42 | 6.16 | ... | 5.36 | 5.56 | 7.01 |
| Norfolk, Va. .. | 5.80 | ... | ... | ... | ... | 6.05 | 7.05 | ... | 6.05 | 6.05 | 7.55 |
| Wash. (w'hse) . | 5.84-6.00 | ... | ... | 5.90 | ... | 5.91-5.95 | 6.61 | ... | 5.85-5.89 | 6.05-6.09 | 7.50-7.54 |
| Buffalo (del.).. | 5.00 | 6.05 | 7.85 | 5.49 | 6.50 | 5.20 | 6.05 | 10.13 | 5.25 | 5.50 | 7.06 |
| Buffalo (w'hse) | 4.85 | 5.90 | 7.70 | 5.34 | 6.35 | 5.05 | 5.90 | 9.98 | 5.10 | 5.35 | 6.91 |
| Pitts. (w'hse).. | 4.85† | 5.75[8]† | 6.95 | 5.00 | 6.00 | 4.90 | 5.65 | 9.60 | 4.90 | 5.05-5.10 | 6.55 |
| Detroit (w'hse). | 5.42‖ | 6.22[8]† | 7.53 | 5.42 | 6.42-6.73 | 5.48 | 6.15 | 8.44-8.59 | 5.48 | 5.67 | 7.02 |
| Cleveland (del.) | 5.00† | 5.90‡ | 6.80-6.96 | 5.15-5.18 | 6.15 | 5.15-5.16 | 5.85 | 8.24-8.40 | 5.15-5.16 | 5.35-5.36 | 6.80-6.81 |
| Cleve. (w'hse). | 4.85† | 5.75‡ | 6.65-6.81 | 5.00-5.03 | 6.00 | 5.00-5.01 | 5.70 | 8.24-8.25 | 5.00-5.01 | 5.20-5.21 | 6.65-6.66 |
| Cincin. (w'hse). | 5.26 | 5.94 | 6.98 | 5.38 | 6.10 | 5.43 | 6.18 | ... | 5.43 | 5.63 | 7.03 |
| Chicago (city). | 5.00-5.20 | 5.90[8]‡ | 7.10 | 5.00 | 6.67-6.83 | 5.05 | 5.85 | 8.25[9] | 5.05 | 5.25 | 6.70 |
| Chicago (w'hse) | 4.85-5.05 | 5.75[8]‡ | 6.95 | 4.85 | 6.52-6.68 | 4.90 | 5.70 | 8.10[9] | 4.90 | 5.10 | 6.55 |
| Milwaukee(city) | 5.18-5.38 | 6.08[8]‡ | 7.28 | 5.18 | 6.82-7.01 | 5.23 | 6.03 | 8.43[9] | 5.23 | 5.43 | 6.88 |
| St. Louis (del.) | 5.37‖ | 6.27[8]‡ | 7.44 | 5.34 | 6.64 | 5.39 | 6.19[12] | 6.64 | 5.39 | 5.59 | 7.04 |
| St. L. (w'hse). | 5.22‖ | 6.12[8]‡ | 7.29 | 5.19 | 6.49 | 5.24 | 6.04[12] | 6.49 | 5.24 | 5.44 | 6.89 |
| Birm'ham (city) | 5.20‖ | ... | 6.60 | 5.20 | ... | 5.15 | 6.83 | ... | 5.15 | 5.40 | 7.73[20] |
| Birm'ham(c'try) | 5.05‖ | ... | 6.45 | 5.06 | ... | 5.00 | 6.68 | ... | 5.00 | 5.25 | 7.58[20] |
| Omaha, Nebr... | 6.13 | ... | 8.33 | 6.13 | ... | 6.18 | 6.98 | ... | 6.18 | 6.38 | 7.83 |
| Los Ang. (city) | 6.60‖ | 8.05 | 8.20† | 6.80 | 9.50 | 6.25 | 8.20 | ... | 6.10 | 6.30 | 8.20 |
| L. A. (w'hse) . | 6.45‖ | 7.90 | 8.05† | 6.65 | 9.35 | 6.10 | 8.05 | ... | 5.95 | 6.15 | 8.05 |
| San Francisco.. | 6.15[21]‖ | 7.50‖ | 8.10 | 6.75[21] | 8.25[18] | 5.90[21] | 7.55 | 10.85[9] | 5.90 | 6.35 | 8.10 |
| Seattle-Tacoma. | 6.70[17] | 9.15[8]‡ | 8.80 | 6.70[17] | ... | 6.20[17] | 8.15[1] | 10.35 | 6.30[17] | 6.35[17] | 8.40[17] |

**Base Quantities:** 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [3]—3000 to 4999 lb; [6]—450 to 1499 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [12]—1000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [20]—400 to 3999 lb: [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † base price, does not include gage extras; ‡ 15 gage; ‖ 18 gage and heavier; ** as annealed; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ top level of quoted range is nominal.

# PRICES OF LEADING FERROALLOY PRODUCTS

### MANGANESE ALLOYS

**Spiegeleisen:** (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

**Standard Ferromanganese:** (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

**Low-Carbon Ferromanganese, Regular Grade:** (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C. 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P. 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

**Medium-Carbon Ferromanganese:** (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c, Delivered. Spot, add 0.25c.

**Manganese Metal:** (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

**Manganese, Electrolytic:** Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

**Silicomanganese:** (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

### CHROMIUM ALLOYS

**High-Carbon Ferrochrome:** Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

**"SM" High-Carbon Ferrochrome:** (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

**Foundry Ferrochrome:** (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

**Low-Carbon Ferrochrome:** (Cr 67-72%). Contract, carload, lump, bulk, max, 0.03% C 31.85c per lb of contained Cr, 0.04% C 29-75c, 0.06% C 28.75c, 0.10% C 28.25c- 28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

**"SM" Low-Carbon Ferrochrome:** (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

**Low-Carbon Ferrochrome, Nitrogen Bearing:** Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

**Chromium Metal:** (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

### SILICON ALLOYS

**25-30% Ferrosilicon:** Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lots 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

**50% Ferrosilicon:** Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

**75% Ferrosilicon:** Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

**80-90% Ferrosilicon:** Contract, carload, lump, bulk 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

**Low-Aluminum 85% Ferrosilicon:** (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices. **90-95% Ferrosilicon:** Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

**Low-Aluminum 90-95% Ferrosilicon:** (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

**Silicon Metal:** (Min. 97% Si and 1% max. Fe.) C.l., lump, bulk, regular 1¢ per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

**Alsifer:** (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

### BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr.). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Ferromanganese Briquets:** (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of, Si). Contract, c.l. bulk 10.80c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicon Briquets:** (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

**Molybdic-Oxide Briquets:** (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

(*Please turn to Page* 170)

# Copper Scrap Market Unsettled

**Consumers lower bids after raising them earlier in the week. All primary metal prices hold unchanged despite continued absence of buying support**

**New York** — Primary nonferrous metal prices held unchanged last week, but price uncertainty developed in the market for copper scrap. After advancing early in the week, prices turned downward and at the close of the week brass ingot makers and refiners were offering 15.00c for No. 1 copper, 13.50c for No. 2 copper and 12.50c for light copper.

**Copper**—Demand for refined copper in domestic dealings has fallen off to a marked degree and has reverted to the dull sessions that prevailed just prior to the drop in price to the 18-cent level. Deliveries of refined copper during May to domestic users probably will be the smallest in many years. Sales of foreign-origin copper were made by a custom smelter to users abroad at 18.25c a pound, New York.

Deliveries to domestic consumers slumped about 37,000 tons during April to only 76,127 tons. Crude production from primary sources declined about 3300 tons while refinery output gained about 5700 tons, totaling 75,951 tons and 93,866 tons, respectively. Crude production by secondary sources amounted to 15,678 tons. Refined stocks at the end of April totaled 76,494 tons compared with 68,450 tons at the end of March and 67,257 tons at the end of April, 1948.

**Lead**—Although demand for lead continues light, sales for May shipment are in excess of the tonnage sold for April delivery. Prices are steady with a leading producer quoting on the basis of 13.85c, St. Louis; another leading producer has made no official change from the 14.80-cent level. In the export market, sales of Mexican lead to non-United States consumers are in fair volume on the basis of 14.00c, f.a.s. Gulf ports.

**Zinc**—Fair sales of prime western zinc were reported last week on the basis of 12.00c, East St. Louis, for prompt shipment, indicating that at least some consumers have reduced inventories to the point where they must re-enter the market to replenish supplies.

Effective as of May 13, the price paid for 60 per cent zinc concentrates at the Eagle-Picher central mill is $77.50 per ton. This represents a reduction of $4 a ton from the previous price when zinc was on the basis of 12.50c, East St. Louis.

**Tin**—Orders M-43 and M-81 which regulate the tin and container industries have been revised to permit greater freedom in end use in tvpe of tin coating. It also permits a moderate increase in allocations to controlled uses. The law is scheduled to expire June 30.

Small amounts of tin slag and tin ashes are being shipped from Banka to the Texas smelter. The most recent shipments constitute 40,000 bags of slag and 7000 bags of ashes. Several other shipments are scheduled to arrive in the near future.

Allocations of pig tin in April amounted to only 2485 tons. This is only the third month since 1921 when deliveries to American consumers have fallen below the 3000-ton level. Imports in April of 8513 tons were slightly lower than those for March which were 8792 tons while the Longhorn smelter output totaled 2572 tons. Indications are that RFC stocks of tin increased about 8800 tons.

## Sets Metal Export Quotas

**Washington**—An export quota of 15,000 short tons has been established for aluminum sheet, plate and strip for the third quarter of 1949, the Office of International Trade has announced. License applications under this quota may be filed with OIT from May 23 through June 10.

The third quarter quota is the same as the second quarter quota which was originally established at 9000 tons, but on May 6 was increased by a supplemental 6000 tons.

The third quarter export quota for refined copper in cathodes, billets, ingots or other forms remains at 27,500 tons, the same as it was for the second quarter.

Nonferrous metals, manufactures or minerals for which third quarter quotas have been increased over those in effect for the second quarter are:

| Commodity | 2nd Qutr. (Net Tons) | 3rd Qutr. (Net Tons) |
|---|---|---|
| Scrap Copper | 2,500 | 4,000 |
| Lead Pigs, Bars and Anodes (includes blocks and ingots) | 1,200 | 3,000 |
| Lead Solder | 100* | 150* |
| Babbit Metal | 100* | 150* |

* Tin content.

For all other major nonferrous metals, manufactures or minerals under export control third quarter quotas remain unchanged from the second quarter, with most under "open-end" licensing provisions.

License applications for third quarter shipments of nonferrous materials under quantitative quotas, other than aluminum, may be filed from June 1 through June 20. License applications for "open-end" commodities may be filed at any time.

## Rod Mill Nears Completion

**Newark, O.**—Production will get under way in June at the new Kaiser aluminum rod, bar, wire and cable mill here, according to D. A. Rhoades, vice president and general manager of Permanente Metals Corp.

The first section of the new mill to start operations will be the remelt department where ingot is prepared for the rod mill. Work in this department must necessarily start in advance of rod mill operations in order to build up a supply of billets. Initial shipments of ACSR (Aluminum cable steel reinforced) and all aluminum cable will begin in July.

The completed Newark plant will have an annual capacity in excess of 100 million pounds of electrical conductor material. The new mill together with existing plant equipment will give Permanente facilities for the production of a wide range of aluminum wire as well as rod, bar and structural shapes up to maximum of eight inches in diameter. Although original plans call only for the production of wire and cable, the company expects to manufacture a number of related products within the next year.

## Brass Ingot Output Declines

**Washington**—Brass ingot production decreased 13 per cent in February to 18,706 short tons, following a drop of 6 per cent in January, according to the Bureau of Mines. Output of No. 1 composition ingot, the most important item, decreased 1568 tons or 20 per cent and production of leaded semired brass and tin bronze declined 24 and 23 per cent, respectively. Output of leaded tin bronze rose 24 per cent and that of manganese bronze 4 per cent.

Total consumption of copper-base scrap by secondary smelters was 5202 tons or 18 per cent less than in January and their receipts of scrap declined one third to 20,112 tons. Use of tin bronze scrap remained virtually the same as in January, but consumption of the other important classifications decreased.

## Develops New Aluminum Alloy

**Oakland, Calif.**—Permanente Metals Corp. has announced the development of a new aluminum alloy, designated as 150S, which offers the metalworking industry the first general-purpose specification alloy to be introduced in twenty years. Its unique combination of properties might be described as intermediate between the popular common alloys 3S and 52S.

Alloy 150S is expected to be of particular interest to the refrigeration, appliance, utensil and building materials manufacturers, some of whom have already converted to its use for a number of items after an extensive testing period. According to company spokesmen, the market for the new alloy will not be limited to these fields as 150S was used successfully during the testing period for the fabrication of such widely diversified products as vending machine parts, irrigation pipe, fruit lugs, wheelbarrow traps and store shelving.

The yield strength of alloy 150S is intermediate between 3S and 52S. In-plant fabrication tests on dozens of different end products establish its workability as approximately equal to that of 3S and its finishing characteristics superior to 3S. Corrosion of 150S is superior to 3S and welding and brazing characteristics of the alloy are termed intermediate between 3S and 52S.

# NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

**Copper:** Electrolytic 18.00c, Conn. Valley; Lake, Nom., Conn. Valley.

**Brass Ingot:** 85-5-5-5 (No. 115) 16.00-17.00c; 88-10-2 (No. 215) 25.50c; 80-10-10 (No. 305) 21.75c; No. 1 yellow (No. 405) 13.50-14.50c.

**Zinc:** Prime western 12.00c, brass special 12.25c, intermediate 12.50c, East St. Louis; high grade 13.00c, delivered.

**Lead:** Common 13.85-14.80c; chemical, 14.90c; corroding, 13.95-14.90c, St. Louis.

**Primary Aluminum:** 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

**Secondary Aluminum:** Piston alloy (6-6 type) 16.00-16.25; No. 12 foundry alloy (No. 2 grade) 15.50-15.75; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 16.50; grade 2, 15.50; grade 3, 14.50; grade 4, 13.50. Prices include freight at carload rate up to 75 cents per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

**Tin:** Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

**Antimony:** American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

**Nickel:** Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

**Mercury:** Open market, spot, New York $83-$86 per 76-lb flask.

**Beryllium-Copper:** 3.75-4.25% Be, $24.50 per lb contained Be.

**Cadmium:** "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

**Cobalt:** 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

**Gold:** U. S. Treasury, $35 per ounce.

**Silver:** Open market, New York, 71.50c per ounce.

**Platinum:** $72-$75 per ounce.

**Palladium:** $24 per troy ounce.

**Iridium:** $100-$110 per troy ounce.

**Titanium (sponge form):** $5 per pound.

## Rolled, Drawn, Extruded Products

### COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

**Sheet:** Copper 31.68; yellow brass 29.10; commercial bronze, 95%, 31.73; 90%, 31.38; red brass, 85%, 30.51; 80%, 30.17; best quality, 29.84; nickel silver, 18%, 42.42; phosphor-bronze, grade A, 5%, 50.82.

**Rods:** Copper, hot rolled 27.53; cold drawn 28.78; yellow brass, free cutting, 23.69; commercial bronze, 95% 31.42; 90% 31.07; red brass 85% 30.20; 80% 29.86.

**Seamless Tubing:** Copper 31.72; yellow brass 32.11; commercial bronze 90% 34.04; red brass 85% 33.42; 80% 33.08.

**Wire:** Yellow brass 29.39; commercial bronze, 95% 32.02; 90% 31.67; red brass, 85% 30.80; 80% 30.46; best quality brass 30.13.

**Copper Wire:** Bare soft, f.o.b., eastern mills, 100,000 lb lots, 23.80, l.c.l. 24.42½c, c.l. 23.92½c; weatherproof, f.o.b. eastern mills, 100,000 lb lots, 25.60, l.c.l. 26.22½; magnet, delivered, c.l. 28.00, 15,000 lb or more 28.25, l.c.l. 28.75.

### ALUMINUM

**Sheets and Circles:** 2s and 3S mill finish c.l.

| Thickness Range, Inches | Widths or Diameters, In., Incl. | Flat Sheet Base* | Coiled Sheet Base | Coiled Sheet Circle† Base |
|---|---|---|---|---|
| 0.249-0.136 | 12-48 | 26.9 | ... | ... |
| 0.135-0.096 | 12-48 | 27.4 | ... | ... |
| 0.095-0.077 | 12-48 | 27.9 | 26.0 | 29.6 |
| 0.076-0.068 | 12-48 | 28.5 | 26.2 | 29.8 |
| 0.067-0.061 | 12-48 | 28.5 | 26.2 | 29.8 |
| 0.060-0.048 | 12-48 | 28.7 | 26.4 | 30.1 |
| 0.047-0.038 | 12-48 | 29.1 | 26.6 | 30.4 |
| 0.037-0.030 | 12-48 | 29.5 | 27.0 | 30.9 |
| 0.029-0.024 | 12-48 | 29.9 | 27.3 | 31.3 |
| 0.023-0.019 | 12-36 | 30.5 | 27.7 | 31.8 |
| 0.018-0.017 | 12-36 | 31.1 | 28.3 | 32.6 |
| 0.016-0.015 | 12-36 | 31.8 | 28.9 | 33.5 |
| 0.014 | 12-24 | 32.7 | 29.7 | 34.6 |
| 0.013-0.012 | 12-24 | 33.6 | 30.4 | 35.5 |
| 0.011 | 12-24 | 34.6 | 31.3 | 36.7 |
| 0.010-0.0095 | 12-24 | 35.6 | 32.3 | 38.0 |
| 0.009-0.0085 | 12-20 | 36.8 | 33.4 | 39.5 |
| 0.008-0.0075 | 12-20 | 38.1 | 34.6 | 41.1 |
| 0.007 | 12-18 | 39.5 | 35.9 | 42.9 |
| 0.006 | 12-18 | 41.0 | 37.2 | 47.0 |

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

**Screw Machine Stock:** 5000 lb and over.

| Diam. (in.) or distance across flats | —Round— R317-T4, 17S-T4 | R317-T4 | —Hexagonal— 17S-T4 |
|---|---|---|---|
| 0.125 | 48.0 | ... | ... |
| 0.156-0.203 | 41.0 | ... | ... |
| 0.219-0.313 | 38.0 | ... | ... |
| 0.344 | 37.0 | ... | 47.0 |
| 0.375 | 36.5 | 45.5 | 44.0 |
| 0.406 | 36.5 | ... | ... |
| 0.438 | 36.5 | 45.5 | 44.0 |
| 0.469 | 36.5 | ... | ... |
| 0.500 | 36.5 | 45.5 | 44.0 |
| 0.531 | 36.5 | ... | ... |
| 0.563 | 36.5 | ... | 41.5 |
| 0.594 | 36.5 | ... | ... |
| 0.625 | 36.5 | 43.0 | 41.5 |
| 0.656 | 36.5 | ... | ... |
| 0.688 | 36.5 | ... | 41.5 |
| 0.750-1.000 | 35.5 | 40.5 | 39.0 |
| 1.063 | 35.5 | ... | 37.5 |
| 1.125-1.500 | 34.5 | 39.0 | 37.5 |
| 1.563 | 34.5 | ... | 37.5 |
| 1.625 | 33.5 | ... | 36.5 |
| 1.688-2.000 | 33.5 | ... | ... |
| 2.125-2.500 | 32.5 | ... | ... |
| 2.625-3.375 | 31.5 | ... | ... |

### LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $19.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $19.00 per cwt. Traps and Bends: List price plus 50%.

### ZINC

Sheets, 17.00c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 16.25c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 15.25c; over 12-in., 16.25c.

### NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

### MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c, Seamless tubes, 80.00c. Shot and blocks, 40.00c.

### MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

## Plating Materials

**Chromic Acid:** 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

**Copper Anodes:** Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 23.84c; oval 27.84c; cast 26.37c.

**Copper Cyanide:** 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

**Sodium Cyanide:** 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

**Copper Carbonate:** 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

**Nickel Anodes:** Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

**Nickel Chloride:** 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

**Tin Anodes:** Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

**Sodium Stannate:** 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

**Zinc Cyanide:** 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, Philadelphia.

**Stannous Sulphate:** Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

**Stannous Chloride** (Anhydrous): In 400 lb bbl, 97.00c; 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

## Scrap Metals

### BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

| | Clean Heavy | Rod Ends | Clean Turnings |
|---|---|---|---|
| Copper | 15.500 | 15.500 | 14.625 |
| Yellow brass | 13.250 | 13.000 | 12.500 |
| Commercial Bronze | | | |
| 95% | 14.625 | 14.375 | 13.875 |
| 90% | 14.500 | 14.250 | 13.750 |
| Red Brass | | | |
| 85% | 14.375 | 14.125 | 13.625 |
| 80% | 14.250 | 14.000 | 13.500 |
| Best Quality (71-80%) | 14.125 | 13.875 | 13.375 |
| Muntz Metal | 12.625 | 12.375 | 11.875 |
| Nickel, silver, 10% | 15.125 | 14.875 | 7.5625 |
| Phos. bronze, A | 17.375 | 17.125 | 16.125 |
| Naval brass | 13.125 | 12.875 | 12.375 |
| Manganese bronze | 13.125 | 12.875 | 12.250 |

### BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 15.00, No. 2 copper 13.50, light copper 12.50, composition red brass 10.50, radiators 7.75-8.00, heavy yellow brass 8.00.

### REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 15.00, No. 2 copper 13.50, light copper 12.50, refinery brass (60% copper), per dry copper content 12.50.

### DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

**Copper and Brass:** Heavy copper and wire No. 1 12.50-13.00, No. 2 11.00-11.50, light copper 10.00-10.50, No. 1 composition red brass 8.50-9.00, No. 1 composition turnings 8.00-8.50, mixed brass turnings 6.25-6.50, new brass clippings 10.50-11.00; No. 1 brass rod turnings 7.50-7.75, light brass 5.25-5.75, heavy yellow brass 6.50-6.75, new brass rod ends 7.50-7.75, auto radiators, unsweated 6.00-6.75, cocks and faucets 7.75-8.00, brass pipe 8.00-8.25.

**Lead:** Heavy 8.00-8.50, battery plates 4.50-5.00, linotype and stereotype 10.50-11.00, electrotype 8.50-9.00, mixed babbitt 11.50-12.00, solder joints, 11.50-12.00.

**Zinc:** Old zinc 4.50-500, new die cast scrap 4.50-5.00, old die cast scrap 2.50-3.00.

**Tin:** No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00, siphon tops 44.00-46.00.

**Aluminum:** Clippings 2S 10.00-10.50, old sheets 6.00-6.50, crankcase 6.00-6.50, borings and turnings 3.00-3.50, pistons, free of struts, 6.00-6.50.

## DAILY PRICE RECORD

| | Copper | Lead | Zinc | Tin | Aluminum | Antimony | Nickel | Silver |
|---|---|---|---|---|---|---|---|---|
| Apr. Avg.. | 21.774 | 15.017 | 14.085 | 103.000 | 17.000 | 38.500 | 40.000 | 71.500 |
| Mar. Avg.. | 23.486 | 18.825 | 17.056 | 103.000 | 17.000 | 38.500 | 40.000 | 71.500 |
| May 2-5 .. | 18.50 | 14.80-14.85 | 12.50 | 103.00 | 17.00 | 38.50 | 40.00 | 71.50 |
| May 6-7 .. | 18.50 | 13.85-14.80 | 12.50 | 103.00 | 17.00 | 38.50 | 40.00 | 71.50 |
| May 9-19 . | 18.00 | 13.85-14.80 | 12.00 | 103.00 | 17.00 | 38.50 | 40.00 | 71.50 |

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

# OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

### PITTSBURGH

| | |
|---|---|
| No. 1 Heavy Melt | $23.00† |
| No. 2 Heavy Melt | 22.00† |
| No. 1 Busheling | 23.00 |
| No. 1 Bundles | 23.00 |
| No. 2 Bundles | 19.50-20.50 |
| No. 3 Bundles | 18.50-19.50 |
| Heavy Turnings | 18.00-19.00 |
| Machine Shop Turnings | 14.50-15.50‡ |
| Mixed Borings, Turnings | 14.50-15.50‡ |
| Short Shovel Turnings | 19.00-19.50 |
| Cast Iron Borings | 18.50-19.50 |
| Bar Crops and Plate | 25.00-25.50 |
| Low Phos. Steel | 25.00-25.50 |

Cast Iron Grades†

| | |
|---|---|
| No. 1 Cupola Cast | 23.00-23.50 |
| No. 1 Machinery Cast | 28.00-29.00 |
| Charging Box Cast | 25.50-26.50 |
| Heavy Breakable Cast | 24.00-25.00 |
| Brake Shoe | 25.00-26.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt | 25.50-26.00 |
| Axles | 33.00-34.00 |
| Rails, Random Lengths | 28.00-29.00* |
| Rails, 2 ft and under | 33.00-34.00 |
| Rails, 18 in. and under | 35.00-36.00 |
| Railroad Specialties | 28.00-28.50 |
| Angles, Splice Bars | 35.00-36.00 |

*Brokers' buying prices.
†Nominal.
‡Crushers buying prices.

### CLEVELAND

| | |
|---|---|
| Heavy Melt. Steel | $18.00-19.00 |
| No. 1 Busheling | 18.00-19.00 |
| No. 2 Bundles | 16.00-17.00 |
| Machine Shop Turnings | 12.00† |
| Mixed Borings, Turnings | 17.50-18.00 |
| Short Shovel Turnings | 17.50-18.00 |
| Cast Iron Borings | 17.50-18.00 |
| Bar Crops and Plate | 22.00† |
| Punchings & Plate Scrap | 22.00† |
| Cut Structurals | 23.00† |

Cast Iron Grades†

| | |
|---|---|
| No. 1 Cupola | 29.00-30.00 |
| Charging Box Cast | 27.00-28.00 |
| Stove Plate | 23.00-24.00 |
| Heavy Breakable Cast | 21.00-22.00 |
| Unstripped Motor Blocks | 21.00-22.00 |
| Malleable | 23.00-24.00 |
| Brake Shoes | 22.00-22.50 |
| Clean Auto Cast | 32.00-32.50 |
| No. 1 Wheels | 27.00-28.00 |
| Burnt Cast | 20.00-21.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt | 24.00-25.00 |
| R.R. Malleable | 23.00-24.00† |
| Rails, 3 ft and under | 32.00-33.00 |
| Rails, Random Lengths | 26.00-27.00 |
| Cast Steel | 28.00 |
| Railroad Specialties | 28.00 |
| Uncut Tires | 24.00 |
| Angles, Splice Bars | 29.00-30.00 |

† Nominal.

### VALLEY

| | |
|---|---|
| Heavy Melt. Steel | $22.00† |
| No. 1 Bundles | 22.00† |
| No. 2 Bundles | 19.00† |
| Machine Shop Turnings | 13.50-14.00† |
| Short Shovel Turnings | 18.50-19.00† |
| Cast Iron Borings | 18.50-19.00† |
| Low Phos. | 24.50-25.00† |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt | 25.00-26.00 |

† Nominal.

### MANSFIELD

| | |
|---|---|
| Machine Shop Turnings | $13.50-14.00† |
| Short Shovel Turnings | 17.50-18.00† |

† Nominal.

### CINCINNATI

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $21.00 |
| No. 2 Heavy Melt. Steel | 20.00 |
| No. 1 Busheling | 20.00 |
| Nos. 1 & 2 Bundles | 18.00 |
| Machine Shop Turnings | 10.00 |
| Mixed Borings, Turnings | 10.00 |
| Short Shovel Turnings | 10.00 |
| Cast Iron Borings | 11.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 28.00 |
| Charging Box Cast | 22.00 |
| Heavy Breakable Cast | 20.00 |
| Stove Plate | 17.00 |
| Unstripped Motor Blocks | 16.00 |
| Brake Shoes | 17.00 |
| Clean Auto Cast | 28.00 |
| Drop Broken Cast | 31.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt | 21.00 |
| R.R. Malleable | 20.00 |
| Rails, Rerolling | 25.00 |
| Rails, Random Lengths | 22.00 |
| Rails, 18 in. and under | 33.50 |

### DETROIT

(Brokers' buying prices, f.o.b. shipping point)

| | |
|---|---|
| No. 1 Bundles | $15.50-16.00 |
| No. 2 Bundles | 12.50-13.00 |
| No. 2 Heavy Melt. Steel | 13.00-13.50 |
| No. 1 Busheling | 15.50-16.00 |
| Machine Shop Turnings | 11 00-12.00 |
| Mixed Borings, Turnings | 11.00-12.00 |
| Short Shovel Turnings | 12.00-13.00 |
| Cast Iron Borings | 13.00-14.00 |
| Punchings & Plate Scrap | 15.50-16.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 22.00-24.00 |
| Heavy Breakable Cast | 17.00-19.00 |
| Clean Auto Cast | 22.00-24.00 |

### BUFFALO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $22.00-22.50 |
| No. 2 Heavy Melt. Steel | 19.50-20.00 |
| No. 1 Bundles | 19.50-20.00 |
| No. 1 Bushelings | 19.50-20.00 |
| No. 2 Bundles | 17.50-18.00 |
| Machine Shop Turnings | 13.00-13.50 |
| Mixed Borings, Turnings | 15.00-16.00 |
| Cast Iron Borings | 15.00-16.00 |
| Short Shovel Turnings | 16.00-17.00 |
| Low Phos. | 24.00-24.50 |

Cast Iron Grades

| | |
|---|---|
| Mixed Yard Cast | 27.00-28.00 |
| Heavy Breakable | 25.00-26.00 |
| Malleable | 23.00-24.00 |
| Clean Auto Cast | 31.00-32.00 |

Railroad Scrap

| | |
|---|---|
| Rails 3 ft. and under | 33.00-34.00 |
| Scrap rails | 28.00-29.00 |
| Rail specialties | 28.50-29.50 |

### PHILADELPHIA

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $21.50 |
| No. 2 Heavy Melt. Steel | 19.00-19.50 |
| No. 1 Busheling | 19.50-20.00 |
| No. 1 Bundles | 22.50-23.00 |
| No. 2 Bundles | 17.00-17.50 |
| Machine Shop Turnings | 12.00-13.00 |
| Mixed Borings, Turnings | 11.00-12.00 |
| Short Shovel Turnings | 15.00-16.00 |
| Bar Crop and Plate | 24.00-25.00 |
| Punchings & Plate Scrap | 24.00-25.00 |
| Cut Structurals | 24.00-25.00 |
| Elec. Furnace Bundles | 21.50-22.00 |
| Heavy Turnings | 21.00-22.00 |
| No. 1 Chemical Borings | Nom. |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 27.00 |
| No. 1 Machinery Cast | 29.00-30.00 |
| Charging Box Cast | 27.00-28.00 |
| Heavy Breakable Cast | 27.00-28.00 |
| Unstripped Motor Blocks | 24.50 |
| Clean Auto Cast | 29.00-30.00 |
| No. 1 Wheels | 29.00-30.00 |

### NEW YORK

(Brokers' buying prices f.o.b. shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $15.50-16.00 |
| No. 2 Heavy Melt. Steel | 12.00-13.00 |
| No. 1 Busheling | 12.00-13.00 |
| No. 1 Bundles | 15.50-16.00 |
| No. 2 Bundles | 13.00 |
| No. 3 Bundles | nominal |
| Machine Shop Turnings | 5.00-7.00 |
| Mixed Borings, Turnings | 5.00-6.00 |
| Short Shovel Turnings | 7.00-8.00 |
| Punchings & Plate Scrap | 19.00-20.00 |
| Cut Structurals | nominal |
| Elec. Furnace Bundles | 19.00-20.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 20.00-21.00 |
| No. 1 Machinery | 21.00-22.00 |
| Charging Box Cast | 18.00-18.50 |
| Heavy Breakable | 18.00-18.50 |
| Unstripped Motor Blocks | nom. |
| Malleable | nom. |

### BOSTON

(F.o.b. shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $15.00-16.00 |
| No. 2 Heavy Melt. Steel | 12.50-13.50 |
| No. 1 Bundles | 15.00-15.50 |
| No. 1 Busheling | 11.00-12.00 |
| Machine Shop Turnings | 6.00-7.00 |
| Mixed Borings, Turnings | 6.00-7.00 |
| Short Shovel Turnings | 10.00-11.00 |
| Bar Crops and Plate | 18.00-19.00 |
| Punchings & Plate Scrap | 18.00-19.00 |
| Chemical Borings | 12.00-13.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 25.00-26.00 |
| Mixed Cast | 22.00-24.00 |
| Heavy Breakable Cast | 18.00-19.00 |
| Stove Plate | 21.00-22.00 |
| Unstripped Motor Blocks | 18.00-20.00 |

### CHICAGO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $20.00-21.00 |
| No. 2 Heavy Melt. Steel | 19.00-20.00 |
| No. 1 Bundles | 20.00-21.00 |
| No. 2 Bundles | 18.00-19.00 |
| No. 3 Bundles | 14.00-15.00* |
| Machine Shop Turnings | 11.00-12.00 |
| Mixed Borings, Turnings | 10.00-11.00 |
| Short Shovel Turnings | 15.00-16.00 |
| Cast Iron Borings | 13.00-14.00 |
| Bar Crops and Plate | 22.00-23.00 |
| Punchings | 22.00-23.00 |
| Elec. Furnace Bundles | 21.50-22.50 |
| Heavy Turnings | 19.50-20.50 |
| Cut Structurals | 22.00-23.00 |

Cast Iron Grades*

| | |
|---|---|
| No. 1 Cupola Cast | 27.00-28.00 |
| Clean Auto Cast | 27.00-28.00 |
| No. 1 Wheels | 27.00-28.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 22.00-23.00 |
| Malleable | 22.00-23.00 |
| Rails, Rerolling | 27.50-28.00 |
| Rails, Random Lengths | 22.00-23.00 |
| Rails, 2 ft. and under. | 28.00-29.00 |
| Rails, 18 in. and under | 29.00-30.00 |
| Railroad Specialties | 24.00-25.00 |
| Angles, Splice Bars | 24.00-25.00 |

* Nominal.

### ST. LOUIS

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $21.00-22.00 |
| No. 2 Heavy Melt. Steel | 19.00-20.00 |
| Machine Shop Turnings | 13.00-14.00 |
| Short Shovel Turnings | 13.00-14.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 26.00-28.00 |
| Charging Box Cast | 20.00-22.00 |
| Heavy Breakable Cast | 19.00-21.00 |
| Brake Shoes | 22.00-23.00 |
| Clean Auto Cast | 28.00-29.00 |
| Burnt Cast | 22.00-23.00 |

Railroad Scrap

| | |
|---|---|
| R.R. Malleable | 21.00-23.00 |
| Rails, Rerolling | 25.00-26.00 |
| Rails, Random Lengths | 21.00-22.00 |
| Rails, 3 ft. and under. | 27.00-28.00 |
| Uncut Tires | 23.00-24.00 |
| Angles, Splice Bars | 26.00-27.00 |

### BIRMINGHAM

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $22.00 |
| No. 2 Heavy Melt. Steel | 22.00 |
| No. 2 Bundles | 20.00 |
| Long Turnings | 20.00 |
| Short Shovel Turnings | 19.00 |
| Cast Iron Borings | 18.00 |
| Bar Crops and Plate | 25.00-26.00 |
| Cut Structurals | 25.00-26.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 33.00-34.00 |
| Stove Plate | 30.00-31.00 |
| No. 1 Wheels | 30.00-31.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 24.00 |
| R.R. Malleable | nominal |
| Rails, Rerolling | 30.00-32.00 |
| Rails, 3 ft. and under. | 31.00-32.00 |
| Angles and Splice Bars | 31.00-32.00 |

### SAN FRANCISCO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $20.00 |
| No. 2 Heavy Melt. Steel | 18.00 |
| Nos. 1 & 2 Bundles | 16.00 |
| Machine Shop Turnings | 12.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 25.00-30.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 20.00 |
| Wheels | 20.00 |
| Rails, Random Lengths | 20.00 |

### SEATTLE

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $22.00 |
| No. 2 Heavy Melt. Steel | 20.00 |
| No. 1 Bushelings | 17.50 |
| Nos. 1 & 2 Bundles | 18.00 |
| No. 3 Bundles | nom. |
| Machine Shop Turnings | 15.00 |
| Mixed Borings, Turnings | 15.00 |
| Punchings & Plate Scrap | 30.00 |
| Cut Structurals | 30.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 25.00 |
| Heavy Breakable Cast | 20.00-22.00 |
| Stove Plate | 25.00 |
| Unstripped Motor Blocks | 20.00 |
| Malleable | 25.00 |
| Brake Shoes | 25.00 |
| Clean Auto Cast | 25.00 |
| No. 1 Wheels | 25.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 22.00 |
| Railroad Malleable | 22.00 |
| Rails, Random Lengths | 22.00 |
| Angles and Splice Bars | 22.00 |

### LOS ANGELES

(F.o.b. car, Los Angeles)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $20.00 |
| No. 2 Heavy Melt. Steel | 18.00 |
| Nos. 1 & 2 Bundles | 16.00 |
| No. 3 Bundles | nom. |
| Machine Shop Turnings | 12.00 |
| Mixed Borings, Turnings | 12.00 |
| Punchings & Plate Scrap | 28.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 25.00-30.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 20.00 |
| Rails, Rerolling | 26.00 |

### HAMILTON, ONT.

(Ceiling prices, delivered)

| | |
|---|---|
| Heavy Melt. | $23.00 |
| No. 1 Bundles | 23.00 |
| Mechanical Bundles | 21.00 |
| Mixed Steel Scrap | 19.00 |
| Mixed Borings, Turnings | 17.00 |
| Rails, Remelting | 23.00 |
| Rails, Rerolling | 26.00 |
| Bushelings | 17.50 |
| Bushelings, new factory, prep'd | 21.00 |
| Bushelings, new factory, unprep'd | 16.00 |
| Short Steel Turnings | 17.00 |

Cast Iron Grades*

| | |
|---|---|
| No. 1 Cast | 48.00 |
| No. 2 Cast | 44.00 |

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

## Sheets, Strip . . .

### Additional sheet production facilities shut down as demand continues to ease

Sheet Prices, Page 146

**Pittsburgh** — Indicated continued easing in sheet supply over remaining months this year was further illustrated last week with decision of Hudson Motor Car Co. to discontinue operating old hand mills at its subsidiary, Valley Mfg. Co.'s plant, New Castle, Pa. This plant is expected to be shut down about July 15, at which time present stocks will be depleted and commitments for sheet bars terminated. Inability to produce sheets at competitive prices with integrated interests is major reason for this action. Similarly Phoenix-Apollo Steel Co., Apollo, Pa., discontinued sheet bar breakdown operations at its plant last week and is expected to complete all finishing operations by July 1. Output has been averaging about 12,000 tons of sheets monthly. Since most of its affiliated company customers are in Chicago area, freight charges involved would make delivered sheet prices at above that quoted by integrated mills in that district even if sheet bars could be obtained at lower prices to permit production at competitive prices at the mill. Major sheet and strip producers' quotations are now all at competitive levels. Revision in extras to a more realistic cost basis has not yet been announced by U. S. Steel.

**New York** — Except for certain specialties, particularly stainless, sheet sellers are virtually covered for the remainder of this quarter, which has only five or six weeks more to go. There may be some last minute cancellations which may release tonnage for shipment elsewhere, but in general producers have little that they can promise definitely.

Meanwhile, they are endeavoring to build up backlogs for third quarter, but so far report little future buying interest.

Republic Steel Corp. has advanced its galvanized Toncan iron $10 a ton as of May 13. This follows reappraisal of production costs on this grade of material. The new price establishes galvanized toncan at $15 a ton over the comparable galvanized steel price.

**Boston** — Reflecting declines in motor and other electrical goods production, demand for silicon sheets is off more sharply than for most other flat-rolled products; orders for these grades are subject to several cutbacks with inventories still sufficient to maintain output at reduced levels. Motors are again being stocked with distributors on consignment, a practice widely employed in prewar selling. Cold-rolled strip backlogs are falling with buyers exerting pressure on quantity extras. More users are looking cautiously at galvanized price trends; also at hot strip and sheet extras revisions, which in some cases now represent inventory value losses up to $10 per ton.

**Philadelphia**—Apart from galvanized products, most sheet sellers have dropped consumer quotas in the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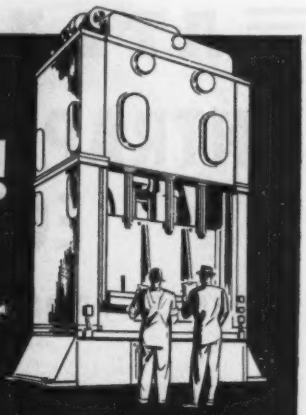
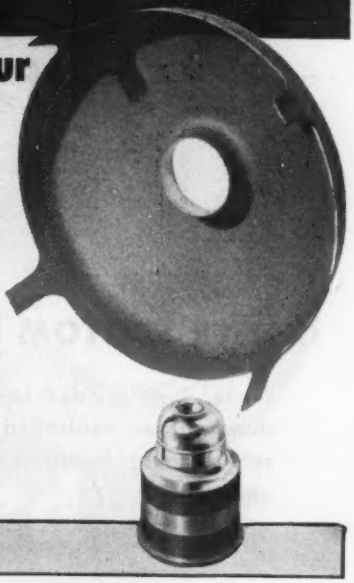


**Exceptional strength... high fatigue limits... wear resistance and resistance to impact**

**—just the material for your tough jobs!**



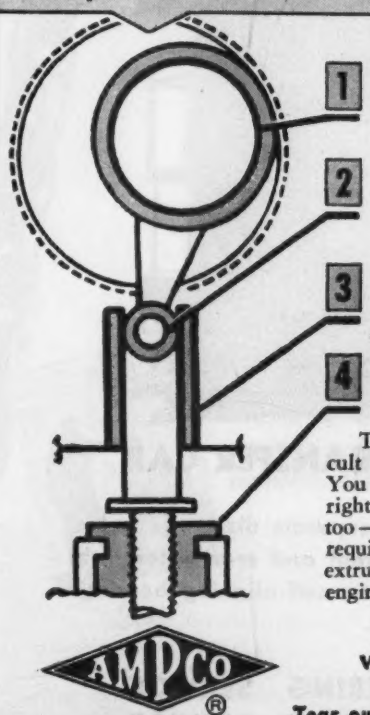
Possibly you don't make or use heavy presses. But probably you *do* have jobs for Ampco Metal — tough jobs where you need the same superior performance that Ampco Metal gives in these press applications.

***Ampco 24 Extrusion Punch Outlasts the Best Steel 10 to 1**

The extrusion punch at the right extrudes a 5/8" hole to a 3 1/4" diameter in a heavy gauge steel water heater head. The best steel punches produced 6600 pieces *maximum*. With the new Ampco Grade 24 punches, production runs of 65,000 pieces became *average* on this job.



**Ampco Bronze in the Press itself!**




**Bronze eccentric bushings** — Ampco Grade 12 Bushings, centrifugally cast, provide a wear-resistant eccentric bearing lining that gives maximum heavy-duty service.

**Bronze wrist-pin bushings** — Ampco Grades 18, 18-23, or 20 centrifugally cast bushings withstand extremely heavy loads without mushrooming. (Ampco field engineers will be glad to recommend proper grade.)

**Bronze-lined guides** — Ampco 8 Sheet used as liners (gibs) give maximum life with minimum wear under varying conditions of load, speed, etc.

**Bronze liner and locking nut** — Ampcoloy E-123 (centrifugally cast) affords up and down adjustment of shutting height without galling and with minimum wear.

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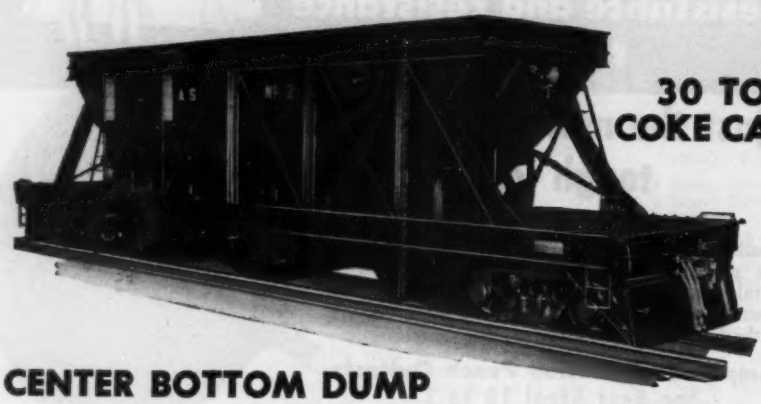
SPEEDS PRODUCTIONS—LOWERS COSTS

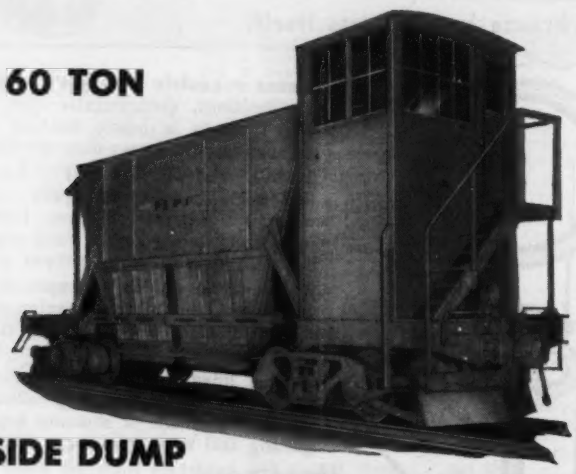


30 TON COKE CAR

CENTER BOTTOM DUMP

Trailer Type divided into two sections with rolling bottom dump gates controlled from locomotive cab. Car has self-aligning bearings, air brakes and standard safety equipment.

60 TON



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ENGINEERS MANUFACTURERS

scheduling of tonnage for third quarter. Cold-rolled sheets are also on the tight side, but setting up of allotments for next quarter represents little more than a gesture, some mills making no effort to put this grade on a quota system.

The Ford Motor strike is reflected in curtailment of specifications by the Budd Co. here; also, incidentally, in suspension of operations at the Ford assembly plant in Chester.

The leading producer has restored the 10 per cent distributors' functional allowance on stainless steel effective as of May 13, and also has eliminated the basketing arrangement.

Bethlehem Steel Co. revised its extras on hot-rolled strip to competitive levels as of May 10.

**Chicago**—Surge of order cancellations, amounting in the case of one district mill to over 40 per cent of the tonnage of new orders received in the latest week, is the most significant market development here. While at this same mill, bookings to date this year are above last year, the weekly order volume has repeatedly been below last year's level in recent weeks. Demand, however, continues strong from the automotive and farm implement industries, even the Ford strike not affecting to any noticeable extent the demands of suppliers for tonnage. This near-term strength apparently does not extend into next year, several suppliers to implement makers saying that normally by this time advance orders are out and schedules are being made up accordingly. Such is not the case this year, there being no indication by many major manufacturers about the size of their next year's requirements. Several automotive parts makers are sure their present high operations will be continued through third quarter at least and are buying steel accordingly. Far removed from this situation is that generally prevailing in household appliance lines as illustrated in three commodities: (1) Refrigerator makers generally expect to maintain present reduced operations; (2) stove makers see in recent slight improvement in sales no justification for raising their present output levels; (3) hot water heater makers expect to coast along on approximately their present schedules. In all three mentioned lines steel supply generally is adequate, but buying is extremely light by many companies while they are working off inventories.

**Baltimore**—Except for galvanized and cold-finished sheets, flat-rolled items generally are in relatively easy supply here. If buyers cannot pick up the material from local mills, they usually can obtain tonnage for delivery within a few weeks from other producers provided they are willing to pay the extra freight.

**Cincinnati**—Sheet mills in this district continue to push production against strong demand, particularly for automobile manufacturing. The outlook for the latter part of third quarter is clouded, however, as many interests hesitate to enter commitments excepting for near needs. The formula was again invoked, after drop in zinc, to adjust prices of galvanized sheets. An ex-

pected pickup in buying for household equipment has failed to appear.

**Birmingham**—Sheet needs are consistent and widespread over this territory with considerable emphasis remaining on roofing sheets due to continued favorable weather of the past several weeks. Sheet backlogs are full, or comparatively so, even with the extra tonnage coming from the Fairfield mill. Strip production is in fair volume with most of the product being stored against the baling season.

**Dallas**—Flat-rolled product supply and demand are coming more into line. This applies to most grades. Prices are slightly easier as the market becomes more competitive. Supply of galvanized sheets, long one of the tight items, is coming into better supply, though inventories are yet unbalanced in some quarters on this item. Demand for cold-rolled is decreasing.

**Los Angeles**—Sheet demand is becoming increasingly spotty, cancellations are more frequent, and producers find it more difficult to fill their rolling schedules. Galvanized in light gages is now the only flat-rolled product in short supply. Buying of strip, bars, and shapes by farm equipment fabricators is holding up well.

**San Francisco**—Fabricators continue to buy only for immediate needs; some are out of market entirely while working down inventories. Overall demand has nearly caught up with total supply, and within another month or two flat-rolled products are expected to be classified as "ample." Some users expect big eastern mills to offer sheets on competitive price basis with western mills within a short time. One fabricator said some eastern mills, by absorbing freight, could undersell western mills on sheets.

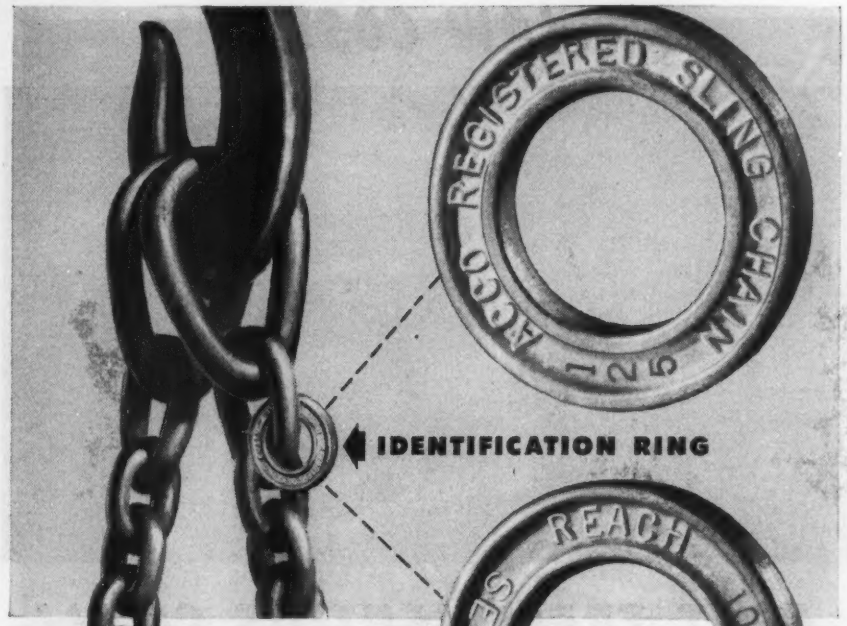
Strike of Columbia Steel Co. workers ended Tuesday afternoon. The dispute now will be arbitrated between the company and union. Loss caused by the 5-day strike totaled 5800 tons of ingot steel and 5000 tons of finished products. Finishing mills were placed in operation Wednesday noon while open hearths were expected to be operating by last Friday.

## Exporter Revises Prices

**New York**—Reflecting adjustments in commodity export rates of freight, effective May 16, United States Steel Export Co. has announced the following new base prices with freight included to New York, Philadelphia or Baltimore.

| | (Per Net Ton) |
|---|---|
| Carbon Steel Ingots: | |
| Rerolling Quality | $64.45 |
| Forging Quality | 65.45 |
| Carbon Steel Billets, Blooms, Slabs: | |
| Rerolling Quality | 67.45 |
| Forging Quality | 76.45 |
| Tube Rounds | 91.45 |
| Rails, Standard, 61 lb and over | 81.65 |
| Rails, Light, 60 lb and under | 86.36 |
| Alloy Steel Ingots: | |
| Forging Quality | 66.45 |
| Alloy Steel Billets, Blooms, Slabs: | |
| Forging Quality | 78.45 |

All prices are base and subject to seller's current lists of extras and conditions of sale. All prices are net cash. All sales are subject to seller's prices in effect at time of shipment.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*SEND for this catalog which contains information on how to select, use and care for sling chains. It is DH-80.*

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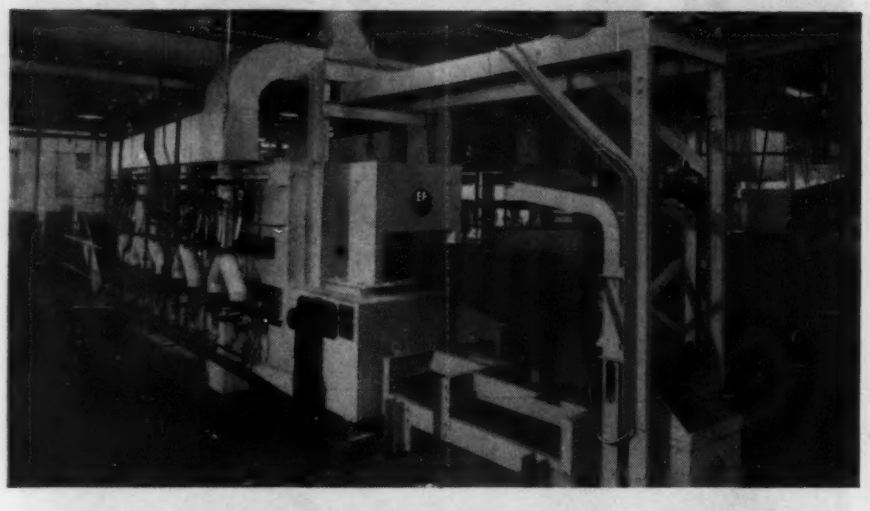
# LOW COST



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# AND MEDIUM SIZE PARTS

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GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION

Salem - Ohio


## Steel Bars . . .

Bar Prices, Page 146

**New York**—With third quarter less than a month and a half away, most hot carbon bar producers have little that they can offer before that time. Buyers' chances for obtaining extra tonnage over the remainder of this period lie largely in cancellations which would release tonnage now scheduled. As a matter of fact, right at the moment there is no great consuming interest for any delivery. Most buyers have fair stocks on hand or tonnage scheduled to come through on old commitments. On certain specialties, such as alloy bars, mills have capacity available for shipment over the remainder of this quarter but even then not much where tonnage is scheduled for extra processing.

**Boston** — Lack of third quarter orders with slight interest indicated in forward commitments marks trend in carbon bars with alloys, including stainless, moving slowly. Most major consuming bar industries, including screw machine products, forge, bolt-nut shops and miscellaneous users, have adjusted to lower summer production schedules and are for most part existing on inventories. With deliveries on both hot and cold-rolled carbon improved to point where tonnage is available in two to three weeks, consumers are content to drift along with fill-in buying. Textile mill equipment builders, among the larger users, are in this category.

**Philadelphia**—Hot carbon bar demand is spotty, with producers still able to make shipments against new orders before the end of this quarter. Meanwhile, they are soliciting third quarter tonnage, with no longer regard to the establishment of consumer quotas. Cold-drawn carbon bar business continues to decline. Some cold drawers estimate a decline of as much as 50 per cent in their June specifications as compared with early in the year.

**Pittsburgh** — Flurry of cancellations, suspension, etc. for carbon and alloy bars is diminishing and there are indications that some customers' inventories are approaching levels where new steel commitments will be necessary. Sellers anticipate a relatively stable market for alloys in the final quarter, perhaps earlier. Deliveries on alloy bars generally are available within three to four weeks from most mills, whose stocks of alloy billets have been augmented substantially.

## Screw Producer Cuts Prices

**New York**—One of the country's principal producers of fastening devices, Parker-Kalon Corp., this city, has announced a substantial price reduction on all types of their slotted head hardened self-tapping screws widely used for metal fastenings. Also, on their hardened screw-nails which are used to fasten metal to wood.

The reduction, covering both bulk and package quantities, will restore prices to the January, 1947 level, and represents a cut of about 11 per cent from prices which have been in effect.

## Tubular Goods . . .

Tubular Goods Prices, Page 147

**Pittsburgh**—Pittsburgh Tube Co. reduced its black and galvanized pipe prices $2 per ton as of May 16 to competitive levels. The company previously had a 1 point lower discount on black and ½ point lower discount on galvanized standard pipe.

In line with action taken by steel pipe producers, A. M. Byers Co., this city, adjusted plus discounts ½ point lower on wrought iron pipe to reflect lower zinc prices, effective May 16.

In sharp contrast to all other steel products, order backlogs for line pipe 16 inches and larger are extended three to four years ahead, although pressure for prompt deliveries has eased considerably. Conversion deal arrangements are gradually being discontinued as contracts expire.

**Cleveland** — Pipe producers are operating at capacity and are having no difficulty disposing of their output. They remain booked solidly for months ahead in line pipe, but report spotty inquiry for standard pipe. Some fabricators, having curtailed operations to two or three days a week, are not taking their full monthly quotas from jobbers. A few of the latter, in turn, have refused their full quotas. Only a pickup in demand within the next few weeks can justify continuance of the present system of distribution of merchant pipe. Some producers already have practically adandoned it; another producer has delayed issuing July quotas until a clearer indication of demand for the month can be obtained; and still another producer is booking quota tonnage 60 days ahead as usual.

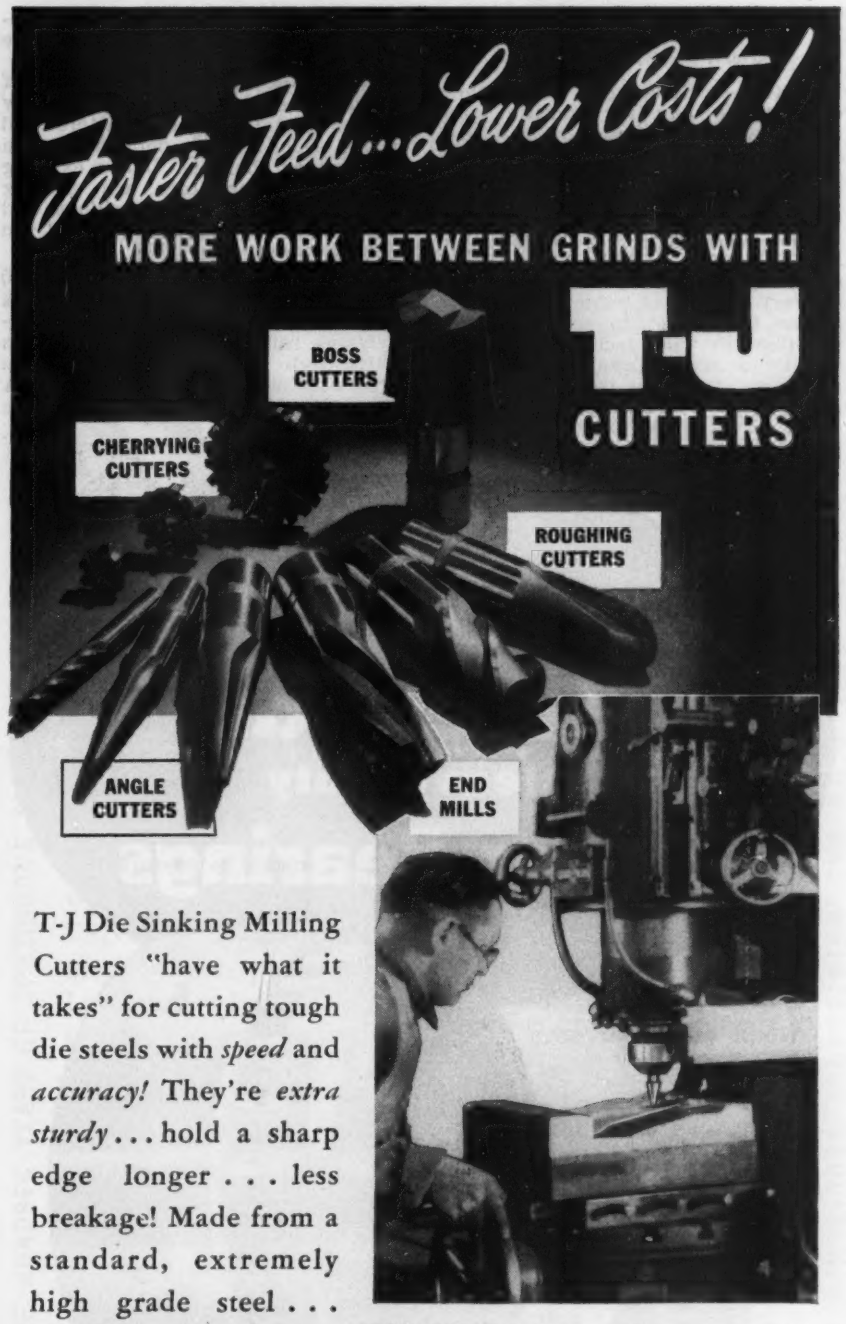
**Los Angeles** — Demand for pipe and tubing is holding at moderate levels, with supplies ample to meet requirements in all categories. Export buying of petroleum equipment has increased substantially, particularly in drilling and maintenance rigs for South American fields. This has long represented a vast potential market, for the oil industry in South America is known to need a great deal of equipment.

**San Francisco**—Pacific Gas & Electric Co. has contracted with Consolidated Western Steel Corp., Los Angeles, for large diameter welded steel pipe for the new natural gas pipeline it will lay from Texas to this city.

According to reports in the trade, the pipe will be manufactured at Consolidated Western's South San Francisco plant, and this will mean an expansion of the mill to handle the order.

Consolidated Western now is producing pipe up to 30 inches at its Maybank plant in Southern California for the Arabian oil project. The Pacific Gas & Electric order will call for pipe of 34-inch diameter. No formal announcement has as yet been made by either Pacific Gas or Consolidated Western of these plans.

**Seattle**—No sizable tonnages for cast iron pipe are immediately pending although several projects larger than average are to be released in the near future.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## Structural Shapes . . .

Structural Shape Prices, Page 147

**Boston** — Structural fabricators continue to buy for specific jobs and show slight interest in inventory volume. As volume of work up for estimates is slow, both private and public construction, orders for plain material are small. Competition among fabricating shops for the limited volume is reflected in lower quoted prices and somewhat better delivery. Failure of public works programs to develop to seasonal level to offset in part decline in private inquiry is disappointing. Numerous contracts for the construction of Army motor vehicle storage buildings have been placed, but these require small lots individually; in the aggregate, around 250 tons.

**New York**—While a fair amount of work is being figured, new inquiry is limited and orders are scattered and small. Public work dominates such demand as there is. Under existing conditions fabricators are making steady inroads in their backlogs, and shape mills are offering steel in greater supply.

**Philadelphia** — Awards of 15,000 tons for a state bridge on Penrose Ave. here and 2700 tons for a Pennsylvania railroad freight terminal in Pittsburgh are outstanding in an otherwise dull structural market. A few scattered projects of fair size are pending, but in general fabricators report little new work in prospect. Meanwhile, they are cutting into backlogs, which now average around three months or maybe a little more. The Phoenixville, Pa., shape producer continues to suspend all steelmaking operations.

**Baltimore** — Consumers can buy shapes for delivery before the end of this quarter. Structural activity is spotty and mainly of public character. About $16 million is contemplated for an emergency school program in Baltimore county, of which expenditure of $6.5 million already has been approved. Bids are now pending on substructure work for the Chesapeake Bay bridge.

**Los Angeles**—Although demand for structural material is tending slowly upward, mills have yet to feel the effect, for most fabricators have supplies adequate to meet present requirements. Private work is somewhat more active, with a few large jobs coming off the shelf after being held up many months for price reasons. Principal source of demand, however, is from public construction, which last month was at the highest April level in the history of the Southwest.

Contracts awarded during the month in Southern California, Southern Nevada, and Arizona, totaled $18,267,585. This was a gain of 154 per cent over the preceding month, and 26 per cent more than April, 1948.

Construction of high-speed freeways is an important and continuing outlet for shapes, reinforcing, and bridge steel, for the more extensive of these projects will require as much as 10 years to complete.

**San Francisco**—Demand remains dull, and supplies are more than ample for all needs. Some demand continues for wide-flanged beams because none are rolled in the West and all orders must be filled by eastern mills.

**Seattle**—Fabricators report a sizable volume of new business in jobs running from 10 to 80 tons each for schools and various industrial plants. The supply situation has eased.

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## Tin Plate . . .

Tin Plate Prices, Page 147

**Pittsburgh**—Easing of tin coating restrictions under orders M-81 and 43, giving producers greater freedom of end use and types of coatings, has been approved for second half. The approved revisions in the orders are held necessary because of anticipated longer shelf life for many food and medicinal containers, and are expected to broaden use of tin in electrolytic operations. Additional tin has been made available to industry for second half, although industry officials were disappointed as to amount.

Although third-quarter tin plate specifications have not yet materialized sufficiently to sustain full production schedules, industry officials are confident output of tin mill products throughout the period will continue limited by supply of coils and production facilities. Less optimism is generally expressed in regard to fourth-quarter operating schedules.

## Plates . . .

Plate Prices, Page 147

**Boston** — Probably no finished steel product has shown such a reversal in form as plates. One of the tightest of all items at start of this year, most plate mills are hungry for tonnage; some filled second quarter schedules with difficulty and most lack sizable orders for early third quarter. As with other steel products, this is breaking down conventional leadtime as mills are forced to revise rolling schedules in line with new buying policy of fabricators. Numerous and frequent price adjustments have a psychological effect; while these downward revisions apply only to former premium tonnage, sharper competition for tonnage and improved supply convinces more buyers some changes in so-called basic standard process may be forthcoming.

**New York**—Plate demand remains dull, with jobbers and direct consumers apparently having fairly rounded stocks on hand and an adequate amount to meet current needs. Some plate mills claim they have not enough tonnage on hand to sustain current operations over the remainder of the quarter; in fact, they look for operations to continue to ease well into the summer.

**Philadelphia**—While plate makers normally figure on a lead time of at least thirty days, some tonnage is now being rolled to specification in less time as operations are no longer being heavily taxed and cancellations and deferments continue. Another district mill has taken off an open hearth during the past week, leaving only one, in the immediate territory at least, that has not to date been forced to retrench as a result of shrinkage in demand.

**Baltimore**—No new ship construction has been scheduled here recently and ship repair work continues light. Consumers can buy plates for delivery before the end of this quarter. Yards which have been protected in their steel requirements by government allocations have sizable stocks on hand and are scaling down on new shipments. In certain instances there have been substantial cancellations of orders. At the same time, some new work is being figured, with the Maryland Dry Docks Co. low on three Staten Island ferry boats for New York city.

District boiler shops report a substantial decline in new business, with backlogs shrinking rapidly.

**Birmingham** — Little change is noted in the overall situation in plates with demand remaining sufficient to keep production at capacity and a comfortable backlog on local mill books. Some additional plate tonnage is moving into warehouse stocks, as demand has slackened somewhat in certain quarters, particularly in carbuilding and ship repair work.

**Dallas**—Fabricators are now able to meet all plate needs and are acquiring ample stocks, though they are not buying beyond short-term requirements. They are facing increasingly competitive conditions in their own markets. Prices are easing off sharply in fabricated supplies, motiv-


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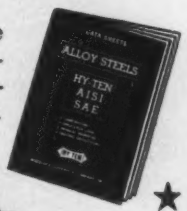
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ated in this section chiefly by a decrease in demand for oil field tanks and other supplies requiring plates.

**Los Angeles**—Reduction of Fontana plate prices to 4.35c, mill, has removed the last premium price from Kaiser Co. products. Company's absorption of freight charges makes its delivered prices competitive in virtually all western marketing areas. Plates remain in strong demand from pipe and tank fabricators, although the requirements of other users generally have been placed on a hand-to-mouth basis.

## Wire . . .

Wire Prices, Page 147

**Boston**—Buying of all wire products is slow with lead-time schedules for third quarter breaking down; no longer are wire users influenced by lead-time closings and as result extensions are frequent with a trend in buying and scheduling approximating prewar patterns. Demand for heading wire remains slack with some screw manufacturers holding up May commitments and in other instances part of June. Manufacturers' wire is also slow while high carbon classifications, emphasis on which has been strong, are included in declines. With shipments in excess of incoming volume, backlogs are declining with some slowing down among finishing departments, although nails are holding fairly well.

**Baltimore**—Most wire products are moving slowly, including manufacturers' wire, with local furniture manufacturers experiencing a considerable letup in business. Agricultural requirements are down seasonally, affecting barbed wire, fence posts, and roofing nails.

**Chicago**—Demand for those wire products for farm use which until now has been strongest, is starting to weaken, one mill reporting that barbed wire fence, steel posts and nails are now moving toward balance with supply, while most other wire business is substantially lighter. A major fastener producer's sales are off from 25 to 30 per cent and purchases have been cut accordingly.

**Birmingham** — Wire prices are steady and demand, while not as insistent as a few weeks ago, is holding up well. Woven fencing is especially wanted by the farm trade while some other grades, notably barbed wire, has slackened. Nails are still scarce in some grades. The need for merchant wire remains strong.

**San Francisco**—Requirements for wire products are light. Western producers are cutting back output.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 146

**Seattle**—Rolling mill operations in this area continue at top levels. Estimating staffs are under heavy pressure as the demand for reinforcing bars remains unabated. Merchant bars are moving freely, but the bulk of output is reinforcing. Much of this business is in small tonnage of less than 100 tons for schools, small industrial plants and miscellaneous construction. The larger tonnages are mostly for public works. Mill backlogs are stationary.

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## Pig Iron . . .

Pig Iron Prices, Page 148

**Washington**—Department of Commerce last week suspended voluntary pig iron allocation, effective at once. With iron plentiful a poll of participating manufacturers shows need for allocations no longer existed. The program, in effect since last July, provided 100,000 tons of iron monthly to manufacturers of housing items.

Meanwhile, it is understood Secretary Sawyer has not yet made up his mind whether or not to ask for extension of Public Law 395 beyond the Sept. 30 expiration date. This law made possible allocation of pig iron, steel and other materials in short supply. Some government officials think the law should be extended for quick application in event of war or other emergency.

Beginning with third quarter, steel allocations, which at one time mounted to close to 600,000 tons monthly, will drop to 272,244 tons monthly.

**New York**—Pig iron demand is quiet, with shipments continuing to decline. Sellers see little improvement before late summer and, meanwhile, are adding to their furnace inventories. Under these conditions it would not prove surprising if some capacity were taken off shortly for repairs.

Republic is switching production at Troy, N. Y., furnace from low phosphorus, of which it now has a good stock, to other grades. Basic there will be quoted at $48, No. 2 foundry $48.50 and malleable $49. Freight rate from Troy to Brooklyn, N. Y., is $5.9572, not including 3 per cent federal tax.

Government allocations of iron for housing requirements have been lifted for June, July, August and September, releasing 88,000 tons per month for general distribution.

**Boston**—Some iron will be moved to Beacon, N. Y. for trans-shipment by rail to New England by Buffalo furnaces first since before the war. Demand for iron is slow with no increase in melt. This lag in rebound for castings is extending inventory supply beyond earlier expectations and explains slowness in buying. Mystic furnace has now piled a substantial tonnage. With lower melt at steelworks, notably in Connecticut, supply of that grade is now in balance with demand with tonnage coming through by water.

**Philadelphia**—The Chester, Pa., furnace is expected to blow out late this week because of slackening in pig iron demand generally. It recently has been operating at a rate of about 400 tons a day and, in fact, had only gotten into full production a few weeks ago after having started up late last year following an extensive rehabilitation program. Slack demand may also affect production elsewhere soon.

**Buffalo**—For the first time since the end of the war the demand for merchant iron is falling short of output. A large number of foundries are now down to one or two days a week. Many are welcoming the lack of business to give workers contractual vacations. As yet, no blast stacks are idle because of the slower demand, but an increased volume of iron is moving out of the area. One producer is moving iron down the canal to an eastern coast storage point. Sellers here are finding it difficult to compete with other markets in the New England territory because of stiffer freight rates. No iron has been piled here, due to outside shipments and the large quantity of iron moving into open hearth consumption. The only idle stack is down for repairs.

**Cleveland**—Republic Steel Corp. has established the following prices for pig iron at its Troy, N. Y., furnace: Basic, $48 per gross ton; No. 2 foundry, $48.50; and bessemer, $49. The company has resumed production of these grades of iron at Troy following a long period during which only low phos was made.

Consumers in this district are not expected to re-enter the market actively until another 30 days at the earliest. Current receipts of iron on old contracts plus inventories are more than ample to cover present needs. Some foundries are pouring only two days and working a third each week, while heats per week range down to only one large one or four small ones. Some pig iron is being shipped from this district to Youngstown mills which are experiencing a temporary shortage in local supplies.

**Cincinnati** — Shipments of foun-


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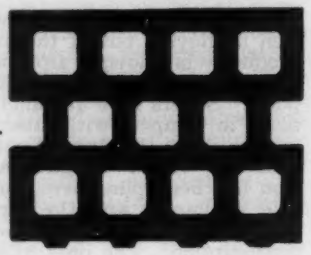

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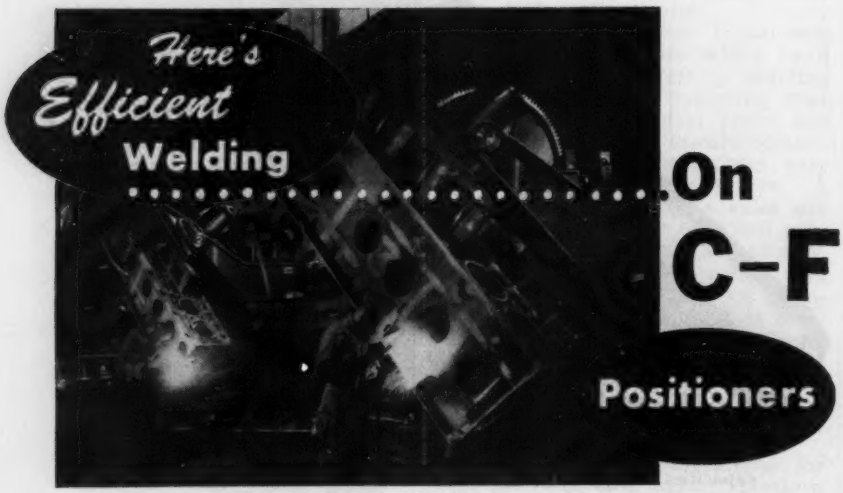


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dry iron into this district are light, possibly 50 per cent of total tonnage received under voluntary allotments when supplies were tight. Melters still desire to hold pig iron stocks to a minimum, despite furnace price cuts, and their ordering is for immediate use only. Outlook for the summer months is not clearly defined, with an upturn before fall none too certain.

**Chicago**—Pig iron sellers think demand will pick up soon despite no appreciable change in foundry operations. They base this opinion on the disappearing stocks of high priced iron which many foundries had collected. How long iron prices will hold at present levels is increasingly a topic for trade speculation, feeling generally being that all that would be required would be for one interest to take the price ball and start running downhill with it. No one apparently wants to make this move because of its inconsistency with present cost economics, and also because a great deal of doubt exists as to whether new business would be stimulated by it. Meanwhile, operations in job shops average around the 3 to 4 days and many shops are virtually dependent on day-to-day orders.

**Birmingham**—Pig iron demand has tapered off considerably over the past three weeks. Merchant iron sellers view the situation as temporary, due largely to big inventories acquired during frenzied buying and the exceptional scrap price situation, along with some slowing down in foundry operations. Republic Steel Corp. is not hurrying its blast furnace repairs at Thomas due to slackened demand and resultant piling of iron.

**Los Angeles —** Reflecting sharply reduced requirements for pig iron, Kaiser-Frazier Parts Co. has placed its Ironton, Utah, blast furnace on a standby basis. Stack was shut down after supplying iron for Kaiser automobile needs and for merchant outlets for the past year. Meanwhile, construction of Kaiser Co. Inc.'s No. 2 blast furnace at the Fontana, Calif., mill is proceeding on schedule. Plans call for the new furnace to be in operation Oct. 1.

## Metallurgical Coke . . .

Metallurgical Coke Prices, Page 148

**Washington**—Third-quarter export quota for metallurgical grades of coke has been set at 50,000 tons, or an increase of 30,000 tons over the quota for the second quarter, the Office of International Trade announced last week.

License applications for third-quarter shipments of metallurgical coke may be filed with OIT any time during the quarter. Coke other than metallurgical grades is not under quantitative export quotas and applications for licenses may be filed at any time.

Other fuels and fuel products which are under export control remain under "open-end" licensing, with no quantitative restrictions, during the third quarter.

Fuel and fuel products are in plentiful domestic supply at the present time, OIT said.

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## Scrap . . .

**Price tone continues weak as bookings remain light in leading districts**

Scrap Prices, Page 152

**Philadelphia** — Steel scrap prices continue to ease. In certain instances where no purchases have been made recently, sellers are offering lower prices in an effort to stimulate business. No. 1 heavy melting steel may now be quoted nominally at $21.50, delivered; No. 2 heavy melting steel, $19-$19.50; No. 2 bundles, $17-$17.50. Short shovel turnings are off to a spread of $15-$16, delivered. Bar crop and plate and punchings and plate scrap have been sold recently at $24-$25 and electric furnace bundles at $21.50-$22. All other grades, including cast grades, are unchanged.

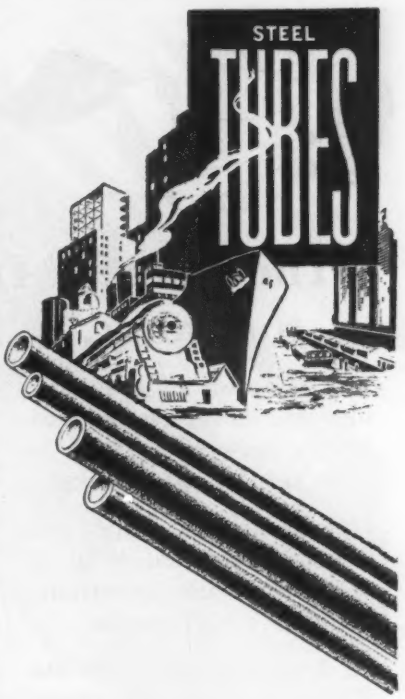
**New York**—Scrap brokers have reduced buying prices on No. 1 heavy melting to $15.50-$16, f.o.b. shipping point; No. 2 heavy melting and No. 1 busheling to $12-$13; No. 1 bundles, $15.50-$16; No. 2 bundles, $13; short shovel turnings, $7-$8. Punchings and plate scrap and electric furnace bundles are being quoted at $19-$20 Cast grades are steady, with demand generally dull.

While this country, according to present indications, will not seek allocations of German scrap for third quarter, there will be some carryover from the current quarter which may result in shipments being received from the other side as late as September, although on a substantially reduced scale. Meanwhile, there is some possibility that this country may again be an exporter of limited amounts of scrap under export license.

**Pittsburgh** — Dealings in open-hearth scrap remained practically at a standstill last week with Nos. 1 and 2 heavy melting steel considered largely nominal at $23 and $22, respectively. Activity in dealer scrap transactions covering other grades also remained restricted. Mills continue to report satisfactory inventories despite a continued high rate of ingot production. Some increased activity is noted in good industrial turnings as blast furnace interests attempt to conserve consumption of coke as a hedge against the possibility of a long coal strike. Foundries continue to show little interest in cast scrap, due to the current light melt. However, crushers claim to be able to buy material suitable for their operations at $14.50. No change in railroad scrap quotations developed last week.

**Cleveland**—Movement of scrap continued extremely slow last week with prices unchanged. Shipments to Republic's Youngstown mills have been completely suspended while local mills are taking only minimums under contracts. Brokers are maintaining a satisfactory position, however, and not becoming overstocked since their receipts from industrial sources have not been up to expectations.

Substitute House bill 284 which would modernize an act in effect since 1902 regulating the scrap industry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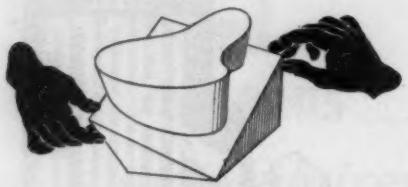

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in Ohio is being considered by the legislature. The bill has passed the House, is now in the Judiciary Committee of the state Senate, and is expected to get an affirmative vote in the Senate. It has the approval of the railroads and the chiefs of police of the state. The unworkable provision which required dealers to hold scrap for 30 days before selling it, for instance, would be eliminated.

**Buffalo**—Except for small sales in blast furnace items, within prevailing ranges, the scrap market continued in the doldrums last week. The recent shifting of a mill consumer from No. 1 heavy melting to the No. 2 grade has narrowed the range on these two grades to $2.50, which compares with $5, or more, during the war. With inertia gripping the market some dealers were fearful that they may suffer losses on present yard stocks, which, in some instances, are fairly substantial.

**Detroit**—A quantity of No. 1 bundles has been offered by Buick, representing additional material over regular May dispositions. Fisher Body bundles this month aggregate 33,000 tons compared with 27,000 tons a month ago, indicating rising production and less allocated material. Some dealer resistance to the $12.50-$13.00 per ton price on No. 2 bundles is being encountered. Cast grades show no life.

**Cincinnati**—Scrap prices remain unchanged, although spotty, light-tonnage purchases indicate a weakness in quotations. Buying interest was lacking throughout the market, none being inclined to supplement inventory and, on the contrary, some melters showed anxiety to cut supplies of scrap on hand. Dullness was evident in the shrinking tonnage moving into the district.

**Chicago**—Scrap market remained in the doldrums last week and the short-lived price stability that marked the opening of the month was again upset as leading brokers indicated their willingness to sell major grades at reductions of $1 from the previous week's offers. On this basis No. 1 heavy melting and bundles are quotable at $20-$21, No. 2 heavy melting at $19-$20, and No. 2 bundles at $18-$19. No. 3 bundles are nominally $14-$15. The market may continue close to its present stagnant state for the remainder of the year. Opinion is that the larger mills continue comfortably fixed for most grades, with future buys by smaller interests to constitute a substantial part of expected business. Yard dealers are operating at drastically reduced levels, in many instances taking in only scrap generated by their most prized accounts.

**Birmingham**—Most reliable sources here describe the price list on scrap as "wholly nominal." The district's biggest user bought some scrap early in the month but will not re-enter the market until sometime in June. Quotations on heavy melting are still carried at $20.

**Dallas**—Sheffield Steel Co., Houston, posted a $3 increase in price for steelmaking scrap last week, making the Dallas basis $17. It has resulted in slightly increased shipments from dealers in this area to the Houston plant. The increase is ex-


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pected to offer some encouragement to collectors that at least the bottom has been reached in the market debacle and there is some hope of an improved trend that will make it worth while to get back in the collection business. The market has demoralized scrap collections in this area and some dealers predict that it will take two to three months for collectors to get back into operation on something like a normal basis—even after prices do return to levels that justify minimum collection costs. There are still no offers from the Chicago, St. Louis or Pittsburgh mills in this section.

**Los Angeles**—Confusion and uncertainty continue to rule the scrap market in this district. Mill buying of domestic material is negligible, with principal reliance being placed on inventory and foreign supplies. One steelmaker has commitments for off-shore scrap sufficient to meet its needs through the rest of the year. Low prices and lessened demand have sharply reduced local collections, with receipts of scrap at dealers' yards off 60 to 70 per cent. Prices are unchanged, but quotations are virtually nominal as little material is moving.

**San Francisco**—Mills are still buying selectively and are resting on large stockpiles kept full by incoming shipments from the Pacific. The price undertone remains soft, but shows no change since the latest reduction early this month.

**Seattle** — Scrap prices are unchanged, mills' prices holding steady at $22 for No. 1, $20 for No. 2 heavy melting and $18 for No. 1 and No. 2 bundles. Receipts are ample but mills are not increasing inventories beyond a safe margin gaged on current operations.

Cast iron scrap is available in tonnages beyond the present needs of foundries which are running only part time. The price of this item is $25 maximum.

## Rails, Cars . . .

Track Material Prices, Page 147

**Philadelphia** — Pennsylvania railroad has ordered 2000 heavy-duty gondola freight cars of 70 tons capacity with deliveries to start in July. Costing in excess of $10 million the cars will be built at the railroad's Altoona, Pa., Works.

The order brings to 6400 the number of new freight cars being supplied by the Pennsylvania. Already in service are 2100 new box cars, 300 new covered hopper cars, and more than 1500 new gondola cars of a previous order for 2000, which will be completed in July.

In addition to the new cars, 17,000 freight cars of many types are being modernized in a program which is well along in shops throughout the railroad. Two hundred new cabin cars of advanced design are also on order.

The new gondolas will have high sides especially adapting them for carrying certain types of freight, such as pipe, scrap metal and fabricated steel.

The railroad carbuilding shops of Pennsylvania Railroad at Altoona, Pa., were closed May 20 until June 1, due to decrease in demand for rail

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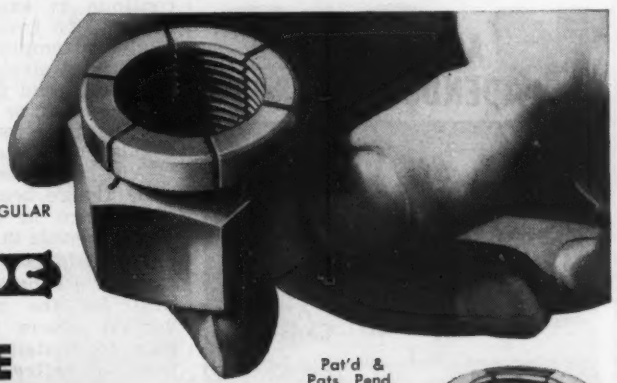
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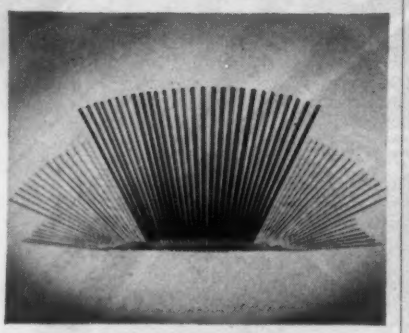

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transportation equipment. About 11,000 employes were furloughed.

**Baltimore**—Railroad needs are tapering, although the Pennsylvania has just closed on 2000 heavy-duty gondolas and the Southern railroad on 200 hopper cars. Wheels, especially one-wear wheels, are still in tight supply.

**Richland**—Bids have been called June 16 by General Electric Co. for construction of a railroad connection to serve this area and Hanford Works, involving 33,473 feet main track, 24,800 feet sidings and yard tracks. The project also includes steel multiple span bridge over the Yakima river and steel girder overpass span. General Electric will furnish truss spans and other steel items, balance to be supplied by contractor.

**Seattle**—Great Northern Railroad is pressure welding four miles of main track in the 7.19 mile Cascade tunnel. Project involves laying 810 tons of new 115-lb rails replacing 110-lb rails.

## Warehouse . . .

Warehouse Prices, Page 149

**Pittsburgh**—Steel distributors have reduced base prices on 16 to 30 gage galvanized sheets $2 to $5 per ton to reflect lower coating extras applicable to mill prices resulting from the recent reductions in zinc prices.

Downward trend in warehouse steel shipments apparently is leveling off as customers' inventories approach realistic levels based on present production schedules and steel supply outlook. However, distributors continue to experience considerable competition from metalworking companies attempting to market premium priced steel obtained on conversion deals and from suppliers in the gray market, or otherwise marketing surplus steel tonnage obtained from regular mill sources.

With the exception of plates and wide flange beams, warehouse steel stocks are in balance and at the highest levels in months.

**Philadelphia**—While some jobbers look for a substantial decline in business for the month now closing, certain others think they will be able to sustain the April rate or possibly better it. All report substantially better mill shipments which have enabled them to meet a more exacting consumer demand. No. 10 gage galvanized sheets are now off to a price of 6.88c for city delivery and 6.73c for country. Some distributors are now equalizing with Pittsburgh mill prices on cold-drawn rounds for country delivery.

**Baltimore** — Reports are current here that one large Philadelphia jobber is planning to meet local warehouse prices in moving tonnage into this district and that another jobber, this one with a warehouse here, is trucking into Washington at prices competitive with the market in that city.

**Cleveland**—Galvanized sheet prices were revised by most warehouses last week, reflecting recent declines in mill prices resulting from lowered zinc costs, but 10 gage sheet held unchanged at 6.65c to 6.81c. Volume of business being done this month is slightly below that reported for April, although some warehouses report no change. Sheets which were originally scheduled to move into plants which are now strike-bound are being shipped to other customers; subcontractors for closed automotive plants generally are accepting scheduled shipments, part of which are going into reserve stocks. Receipts of mill shipments are not as large in some instances as had been expected, but this is permitting warehouses to reduce stocks of some items which had become burdensome. Stocks have shown steady improvement and are now close to prewar standards.

**Cincinnati**—Sales of steel by warehouses are spotty, but holding fairly close to recent levels. Jobbers are getting heavier shipments from mills in most products. In fact, shipment holdups are more frequent as warehouses try to maintain balance in stocks by refusing excessive shipments on some items. Shortage still exists in structurals and heavy plates.

**Chicago** — Hand-to-mouth buying, which is now characteristic of many steel consuming groups, is reflected in warehouse operations, total sales of many distributors showing an unchecked decline. One district distributor sustained an operating loss in April, its first in nine years. The tendency to buy only for immediate needs has transferred some demand from mill to warehouse, but at the same time the increased availability of mill steel has resulted in some former customers who were eking out their requirements from a number of warehouses now being able to get all the steel they need under mill quotas. Inventories of warehouse customers, according to a recent check, are in all cases held to less than 90 days, with approximately 20 per cent of the reporting customers maintaining less than 15 days' stocks. Some amount of buying hesitancy can be traced directly to possibility of price declines, but primary cause for the existing caution is customers' uncertainty as to future levels of operations.

**Birmingham** — Warehouse steel stocks are showing a modest improvement in this section. Some items remain scarce, but stocks for the most part are more complete than they have been in several years.

**Dallas**—With supplies increasing, warehouses in this area are now engaged chiefly in balancing inventories. There is an over-supply in some categories and under-supply in others, but warehousemen believe that balanced inventories will be achieved by late June or July. Some adjustment downward is being made in prices. Some mills are reducing prices slightly to meet competition and to aid in bringing about a leveling out of prices that were excessively high on numerous items. Warehouses are making adjustments to meet mill reductions.

**Los Angeles** — Steel jobbers now have few supply problems, their only shortages being in light gage galvanized and some grades of plate. Demand generally is light, although several warehouses report steady improvement in recent weeks. Steel buying by agricultural implement makers is holding up fairly well.

Many small manufacturers of appliances and consumer products who have been living off inventory for months have now worked out their supplies and are back in the market. Their orders are invariably for immediate use on a strictly hand-to mouth basis.

**San Francisco**—Most jobbers are placing orders as cautiously as fabricators. Some warehouses which a few months ago had badly balanced inventories because of shortages of many steel products, now are as badly unbalanced because of excessive inventories of the same items. Business still lags in almost all categories. First quarter volume, which was off about a third from a year ago, is likely to show further contraction in the second quarter.

## Bolts, Nuts . . .

**Bolt, Nut, Rivet Prices, Page 149**

**Pittsburgh** — A further decline in order backlogs among fastener producers is noted, with most interests operating at substantially reduced rates. No price reductions have been reported among producers, although keen competition exists with freight absorption frequently playing an important role in obtaining new or holding old customers. Some interests never did revise their pricing policy of quoting on former basing points; others established mill prices with the announced intention of meeting competition when desirable.

**Baltimore**—Bolt and nut manufacturers report a substantial decline in new business, with backlogs shrinking rapidly. Hot-rolled carbon bars are available for delivery before the end of this quarter, although some producers are in position to offer little before third quarter, which is now only about five or six weeks away.

## Castings Prices Decline

**Pittsburgh** — Additional price reductions on castings have been put into effect by jobbing foundries here. These cuts range from about 10 to 20 per cent from levels prevailing late last year. Increased competition is developing from job shops outside this district and there is no indication of improved demand, although the recent downtrend in new business appears to be leveling off.

Large captive foundries, notably railroad shops, as well as jobbing foundries are operating three to four days per week. Some foundries are shut down temporarily, particularly those serving enamelware, plumbing and radiation industries.

## STRUCTURAL SHAPES . . .

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3365 tons, American Can Co., Milwaukee, to American Bridge Co., Pittsburgh.

2700 tons, freight terminal, Pennsylvania railroad, Pittsburgh, to Ingalls Iron Works, Birmingham, Ala.

240 tons, Heron St. swing bridge, Aberdeen, Wash., to Pacific Car & Foundry Co., Seattle; project also involves 65 tons steel grill


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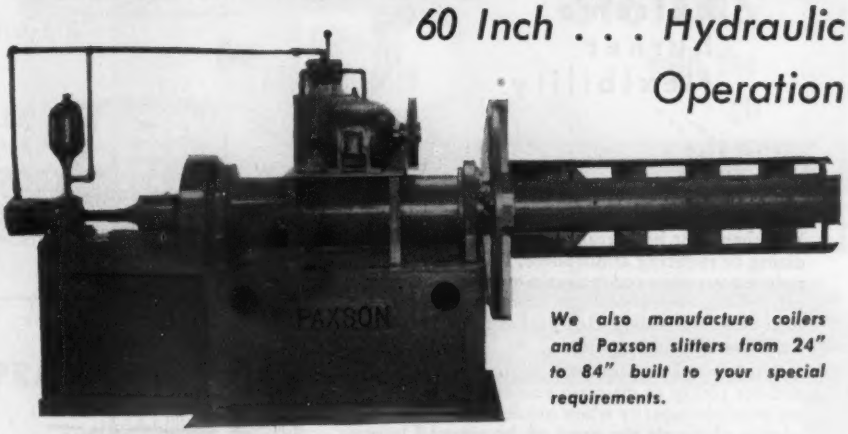


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#### STRUCTURAL STEEL PENDING

3000 tons, research flight hangar, NACA, Langley Field, Va.; bids asked.

800 tons, Pennsylvania state turnpike bridge over Swatara Creek; bids May 27.

750 tons, Du Pont chemical plant, Bloomington, Tex.; bids opened May 20.

550 tons, state office building, Trenton, N. J.; bids to be opened May 24.

Unstated, multiple span bridge, Yakima river, Washington state, and steel overpass, Hanford Atomic Works project; bids to General Electric Co., Richland, Wash., June 16.

Unstated, Alaska Railroad project Turnagain Arm; Peter Kewit Sons Co. and S. Birch & Sons, Seattle, joint low bidders, $5,436,036.

## REINFORCING BARS . . .

#### REINFORCING BARS PLACED

1200 tons, state bridge, Penrose Ave., Philadelphia, to Bethlehem Steel Co.

200 tons, miscellaneous building projects in small tonnages, to Bethlehem Pacific Coast Steel Corp., Seattle.

170 tons, Washington state Long Lake highway bridge, to Northwest Steel Rolling Mills Inc., Seattle; Henry Hagman, Cashmere, general contractor.

150 tons, commercial building Juneau, Alaska, and miscellaneous awards, to Northwest Steel Rolling Mills Inc., Seattle.

#### REINFORCING BARS PENDING

200 tons, Washington state highway projects; bids to Olympia May 27.

Unstated, 5-story concrete addition to Our Lady of Lourdes hospital, Pasco, Wash.; John W. Maloney, Seattle, architect; bids soon.

## PLATES . . .

#### PLATES PENDING

Unstated, ⅛ million gallon water tank for Tumwater, Wash.; bids to Ethel Green, city clerk, May 19.

## PIPE . . .

#### STEEL PIPE PENDING

Unstated, 150,000 feet, 4 to 10 inch water mains; P. S. Lord Construction Co., Portland, Oreg., low $182,706 to King county district No. 75, Seattle.

#### CAST IRON PIPE PENDING

Unstated, 22,700 feet, 4 to 8 inch cast iron pipe and fittings; bids to W. J. Walkup, clerk, district No. 78, Renton, Wash.

Unstated, 6700 feet, 4 to 10 inch cast iron pipe, or alternatives, and fittings; bids to A. T. Osberg, superintendent, King county district No. 20, May 23; Gardiner & Hitchings, Arctic Bldg., Seattle, engineers.

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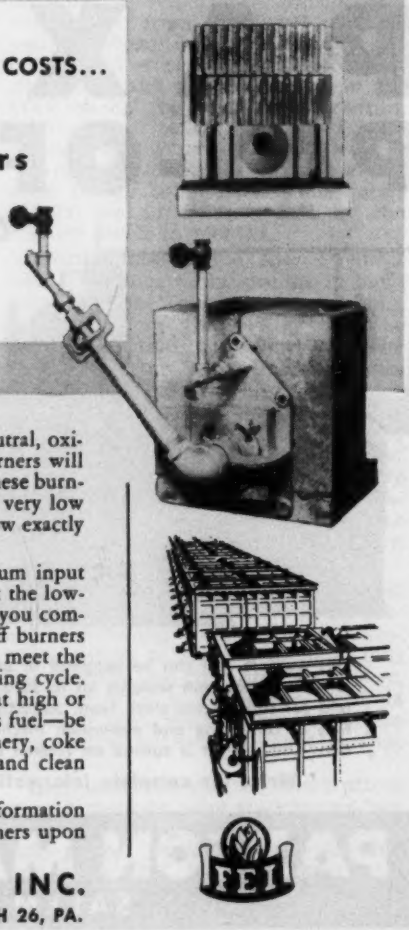

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### CALIFORNIA

EAST LOS ANGELES—Union Hardware & Metals Co., 411 East First St., Los Angeles, has awarded a $1,579,000 contract to Baruch Corp., 5655 Wilshire Blvd., for construction of a warehouse and office.

EAST LOS ANGELES—Clorox Chemical Co., 850 42nd Ave., Oakland, Calif., has awarded a $130,000 contract to Wm. P. Neil Co., 4814 Loma Vista Ave., Los Angeles, for construction of a factory; Reliance Engineering Co., 2922 Sunol Dr., Los Angeles, engineer.

SAN FRANCISCO—San Francisco Brewing Corp., 490 Tenth St., has awarded a $400,000 contract to Cahill Construction Co., 206 Sansome St., for construction of a storage building; Ray N. Moore, 617 Bryant St., engineer.

SOUTH GATE, CALIF.—Purex Corp. Ltd., 9300 Rays Ave., will build a $100,000 plant; David R. Edwards, 5911 Pine Ave., Maywood, Calif., engineer.

### DELAWARE

WILMINGTON, DEL. — News-Journal Co., Orange & Girard Sts., will not construct a newspaper printing plant, $500,000. Project abandoned.

### ILLINOIS

CHICAGO—Chicago, Milwaukee, St. Paul & Pacific Railroad, R. J. Middleton, chief engineer, Union Station, has awarded a $150,000 contract to Ragner Benson Inc., 4744 West Rice St., for construction of an engine barn.

CICERO, ILL.—Cities Service Oil Co., 70 Pine St., New York, has awarded a $4 million contract to Sumner S. Sollitt & Co., 307 N. Michigan St., Chicago, for construction of a plant.

MCCOOK, ILL.—Armour & Co., Union Stock Yards, Chicago, has awarded a $3.5 million contract to E. B. Badger & Son, 75 Pitts St., Boston, for construction of a design and construction plant.

STICKNEY, ILL.—Public Service Co. of North Illinois, 72 W. Adams St., has awarded a $500,000 contract to Ragner Benson Inc., 4744 W. Rice St., Chicago, for construction of a gas station.

### KANSAS

LEOTI, KANS.—C. D. Jennings, Grain Co., Hutchinson, Kans., will build a $300,000 grain elevator.

### MASSACHUSETTS

DARTMOUTH, MASS. — Carbide & Carbon Chemical Corp., 205 East 42nd St., New York, has awarded a $68,000 contract to Coleman Construction Co., 49 Westminster St., Providence, R. I., for construction of a plant, Faunce St.

### MINNESOTA

SOUTH ST. PAUL, MINN.—Chicago Great Western Railway, W. C. Groth, engineer, 309 W. Jackson Blvd., Chicago, will spend $2.5 million in construction of freight yards, buildings, etc., south of Union Stockyards.

### MONTANA

GREAT FALLS, MONT. — Farmers Union Grain Terminal Association, Snelling Ave. N. and Larpenteur Ave. W., St. Paul, has awarded a $200,000 contract to Henry George & Sons Co., Hutton Bldg., Spokane, for construction of a grain elevator.

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THE MODERN TIN PLATE

## NEW JERSEY

WESTVILLE, N. J.—Girdler Corp., 224 E. Broadway, Louisville, has awarded a contract to Freeport Sulphur Co., 122 East 42nd St., New York, for construction of a plant.

## NEW YORK

NEW YORK, N. Y.—Charles A. Buckley, 21 West 192nd St., will build a $266,017 garage, Jerome Ave. near Bedford Park Blvd.; plans by William A. Glesen, c/o owner.

## OHIO

ASHLAND, O.—Union Malleable Mfg. Co., Clark St., will build an addition to its manufacturing plant, estimated cost $100,000, located at First and Eighth Sts.

CLEVELAND — Cleveland Twist Drill Co., East 49th & Lakeside Ave., plans a new multiple-story building, estimated cost $1 million, which will adjoin the west end of the present main building.

CLEVELAND—Cleveland Stevedore Co., foot of West Ninth St., will build a $125,000 warehouse on lower Cuyahoga river dock.

COLUMBUS, O.—Scott-Viner Co., 540 W. Poplar Ave., will build a $300,000 factory for manufacturing food-harvesting machinery, Kinnear Rd.

TOLEDO, O.—Henry C. Beck Co., 1225 Indiana Ave., will build a $125,000 warehouse.

## PENNSYLVANIA

NEW CASTLE, PA.—Pennsylvania Power Co. has awarded a $11.5 million contract to Townsend & Bottum Inc., Ann Arbor, Mich., for addition to the West Pittsburgh power plant.

PITTSBURGH—Union Railroad, F. R. Smith, chief engineer, East Pittsburgh, has awarded a $700,000 contract to Dick Construction Co., 2532 Library Rd., for construction of a diesel shop, Hall Station.

PITTSBURGH — Charles Rohrich, 2140 W. Liberty St., will award a $125,000 contract to O. H. Martin Co., 18 First St., for construction of a garage.

SAEGERTOWN, PA. — General American Transportation Co. will build a tank-car maintenance and repair depot adjoining the main Erie Railroad line.

## SOUTH CAROLINA

KOLLOCKS, S. C.—J. P. Stevens Co. Inc., c/o J. E. Sirrine Co., architect, Greenville, S. C., will build a $1.8 million plant; award postponed indefinitely.

## TEXAS

DALLAS—Williams & Wagner, 2124 Main St., has awarded a $110,000 contract to Williams & Wagner Construction Co., same address.

DALLAS—Western Hatcheries Inc., 903 Elm St., has awarded a $260,000 contract to Joplin & Spencer, 331 Louisiana St., for construction of a hatchery plant.

FORT WORTH, TEX. — Swift & Co., c/o North Fort Worth Stockyards, will build a $100,000 cooler and manufacturing building.

GANADO, TEX.—South Texas Generating Cooperative, Victoria, B. C., will build a $790,000 generating plant.

HOUSTON—Dalton Burns & Associates, 2911 Tangley St., will build a $110,000 plant.

MCKINNEY, TEX.—Texas Textile Mills will build a $150,000 mill.

ODEM, TEX.—Smith Gin Co. will build a $115,000 cotton gin mill.

PORT ARTHUR, TEX.—Jones & Laughlin Steel Corp. will build a $110,000 plant.

SAN ANTONIO, TEX.—San Antonio Machine & Supply Co., 2000 S. Laredo St., has awarded a $100,000 contract to A. P. Rheiner & Sons, Insurance Bldg.

STRATFORD, TEX.—Riffe Bros., Stratford and Amarillo, will build a $200,000 grain elevator.

TEXAHOMA, TEX. — Riffe Bros., Stratford and Amarillo, will build a $225,000 grain elevator.

## VIRGINIA

RICHMOND, VA.—American Machine & Development Co., 315 South 15th St., will build a $130,000 factory, Gordon St.; plans by Ballou & Justice, 106 E. Cary St.; O. E. Eissmann, c/o owner, chief engineer.

RICHMOND, VA.—Liggett & Meyers Tobacco Co., 101 South Sixth St., will spend $400,000 in general alterations, repairs to plant. Contract awarded to Doyle & Russell Inc., Central National Bank Bldg.

## WASHINGTON

YAKIMA, WASH.—Inland Pipe & Supply Co. has awarded a $73,614 contract to Leo S. Ross Construction Co. for construction of a warehouse; J. W. Maloney, Larson Bldg., architect.

## WISCONSIN

MILWAUKEE—Cutler-Hammer Co., 315 North 12th St., has awarded a contract to Walter W. Oeflein Inc., 5345 N. Hopkins St., for construction of a factory; Eschweiler & Eschweiler, 720 E. Mason St., architect.

MILWAUKEE—A. C. Spark Plug Division, General Motors Corp., Detroit, has awarded a $170,000 contract to Roland H. Becker Inc., Elm Grove, for building; F. F. Droishagen, 647 W. Virginia St., engineer.

## CANADA

LINDSAY, ONT.—Visking Corp. will build two plant wings, day labor, approximately $500,000.

LONDON, ONT.—Prack & Prack, architect, 310 Main St. E., Hamilton, Ont., will soon let contract for a factory, Highway & Bridges Sts., for Eaton, Wilcox & Rich Ltd., 379 Fleet St. W., Windsor, Ont., for $425,000.

ARVIDA, QUE.—Aluminum Co. of Canada Ltd., Sun Life Bldg., Montreal, Que., will build a $1 million laboratory.

MONTREAL, QUE.—Canadian Tube & Steel Products Ltd., 5765 Hamilton St., has awarded a $80,000 contract to Ross & Anglin Ltd., 4400 Ste. Catherine St. W., for construction of a plant.

QUEBEC CITY, QUE.—Quebec Railway Light & Power Co. Ltd., 600 Dorchester St. W., will spend $200,000 in water gas and coal gas plant repairs.

# PRICES OF LEADING FERROALLOY PRODUCTS

(*Continued from Page* 149)

### CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered, Spot, add 0.25c.

### TITANIUM ALLOYS

**Ferrotitanium, Low-Carbon:** (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots, 2" x D, $1.40 per lb of contained Ti; less ton $1.45, (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

**Ferrotitanium, High-Carbon:** (Ti 15-18%, C 6-8%). Contract, $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

**Ferrotitanium, Medium-Carbon:** (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

### VANADIUM ALLOYS

**Ferrovanadium: Open-Hearth Grade** (Va 35-55%, Si 8-12% max., C 3-3.5% max). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

**Grainal:** Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c, freight allowed.

**Vanadium Oxide:** Contract, less carload lots, $1.20 per lb of contained $V_2O_5$, freight allowed. Spot, add 5c.

### TUNGSTEN ALLOYS

**Ferrotungsten:** (W 70-80%). Contract, 10,000 lb W. or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

**Tungsten Powder:** (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W., $3.

### ZIRCONIUM ALLOYS

**12-15% Zirconium Alloys:** (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

### BORON ALLOYS

**Ferroboron:** (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

**Borosil:** (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

**Bortam:** (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

**Carbortam:** (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

### OTHER FERROALLOYS

**Ferrocolumbium:** (Cb 50-60%, Mn 5% max., Si 8% max, C 0.5% max.). Contract, ton lot. 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

**CMSZ Mixes:** (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

**Silcaz Alloy:** (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed. ½" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5. Delivered. Spot, add 0.25c.

**Graphidox No. 4:** (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 16.50-17.00c per lb of alloy; ton lots 17.90-18.00c; less ton lots 19.40-19.50c. f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

**V-5 Foundry Alloy:** (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

**Simanal:** (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

**Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base):** Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

**Ferromolybdenum:** (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

**Technical Molybdic-Oxide:** Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.